JOURNAL

OF THE

INDIAN MEDICAL ASSOCIATION

Vol. XIII *Calcutta, May, 1944* No. 8

SULPHANILAMIDE IN SMALL POX*

S. G. VENGSARKAR, M.D., F.C.P.S.,
Superintendent, City Fever Hospitals
AND
J. V. RANGNEKAR, M.B.B.S.,
Resident Medical Officer, City Fever Hospitals, Bombay

INTRODUCTION

Sulphanilamide was introduced by Domagk in 1935. Its various preparations have since then been tried successfully either, as specifics, or to reinforce effects of other specific remedies in the treatment of some or all diseases caused by streptococcus, pneumococcus, meningococcus, gonococcus, staphylococcus etc. and also in intestinal infections like bacillary dysentery. Though the success with treatment by sulphanilamide and its compounds is conspicuous in most of the important bacterial infections, these drugs do not appear to have any specific effect on diseases caused by various kinds of virus infections except in the case of lymphogranuloma and trachoma. A few workers have tried this chemotherapy on a small number of cases of small pox with contradictory results. As there is sufficient material of this nature for trial at this hospital, investigation was taken up with a view to evaluate definite effect of these drugs in the treatment of small pox.

MacCammon (1936) pointed out the result of these drugs in shortening the period of this disease by treating 7 cases of small pox associated with mascular eruptions and few pustules.

King and Rozario (1938) observed that secondary fever did not appear when prontosil rubrum was given on the fifth day of the disease.

Patel and Naidu (1940) reported that while sulphanilamide has no influence on the course of small pox except in septic cases, its administration helped in the reduction of mortality rate in the confluent variety of the disease by about 30 per cent.

Mallya and Chatterji (1940) on the contrary, pointed out that mortality rate was higher in those cases that were treated with sulphanilamide than those who were not treated with this drug, though they admitted that fewer complications developed in the former group of cases. Again, Moore (1940) treated 6 cases of confluent variety of small pox with sulphanilamide followed by 100 per cent mortality.

Pierna (1940) treatel 7 cases of small pox with sulphanilamide and reported that it produced early improvement in the general condition of the patients, subsidence of fever and cessation of the lesions. The vesicles became converted into attenuated pustules which developed in 4-6 days with subsequent shreding of the crusts in course of the next 4-6 days. There were no complications. The author concluded that the drug reduced the period of evolution of the lesions to less than half of the normal, attenuated the virus, and hence regarded the drug as specific for the disease.

Chakravarty and Ghosh (1941) also reported successful treatment of small pox with sulphanilamide and sulphopyridine. Charion (1942) treated cases of small pox with sulphanilamide and sulphathiazole. He reported that these drugs do not abort the disease nor do away with its pustular stage, if given early. They are valuable drugs in the pustular stage of the disease for lessening toxic effects due to absorption of septic products in acute stage, for preventing incidence of septic complications, reducing the mortality rate and minimising the disfigurement. He considers sulphapyridine to be more useful than other preparations of sulphanilamide in this disease.

Wilkinson (1942) treated 103 cases recently with sulphanilamide and concluded that the drug has no effects on the toxic phase of the disease and has no action on the virus of the disease. It modifies skin lesions of the disease as is done by vaccination. It is extremely effective in the complications associated with the earlier phase and if given early in the latter phase of the disease, it modifies the number of lesions, lessens the incidence of septic complications, the degree of subsequent scarring and reduces the mortality rate amongst patients with septic complications.

* Read before the meeting of the American Army Medical Officers who visited the City Fever Hospitals, Bombay on 2nd August, 1943.

In order to arrive at a fairly definite conclusion as regards effects of these drugs on the course, signs, complications and mortality rate of this disease, these drugs were given to a considerable number of patients, *viz.*, 548 since the epidemic outbreak of the disease in 1941. This disease is endemic in Bombay and a number of patients are admitted into this hospital for isolation and treatment in the winter and summer seasons every year for the last 4-5 years due to epidemic outbreak of this disease or owing to an exacerbation of the endemic disease.

A report was made by Vengsarkar, Punan, and Walawalkar (1942) about the earlier observations on this subject. They concluded, then, that while these drugs have no apparent effect on the virus of this disease, chemotherapy when administered in the papular stage of the disease helps to lower its mortality rate, especially in its grave variety *viz.*, confluent form of the disease, to reduced toxæmia, to lessen the incidence of complications, to hasten the process of recovery of local lesions and to shorten convalescent period.

Materials for Investigation

The drug was given in these cases as pure sulphanilamide (prontosil or septanilum or bisulphonamide). The administration of chemotherapy was commenced in a series of cases early in the papular stage of eruption, *i.e.*, on 4th to 6th day of the disease, in others 2-4 days later, *i.e.* in the vesicular stage, and in the remaining cases even later, *i.e.*, in the fully developed pustular stage from 8th to 10th day of the disease. For this purpose, the total 548 cases were divided into 4 groups *viz.*, papular (119 patients) vesicular (106 patients), pustular (87 patients) according to the stage of the disease at which the treatment with sulphanilamide was commenced and the control group, consisting of the remaining 236 patients treated with the routine symptomatic treatment without sulphanilamide.

The drugs were given in tablet form in the following doses:

For Adults: (each tablet of 7½ grains). 2 tablets every 4 hours for the first 48 hours. 2 tablets every 6 hours for the next 48 hours. 1 tablet every 4 hours for the next 48 hours.

The average total quantity of the drug required per patient was about 52 tablets or 26 gms. The doses were varied according to the age and individual indications.

Patients in the late stage of the disease with scab formation and those that died within 48 hours after admission were not included in this series for obvious reasons.

The above-mentioned 4 groups were further subdivided into vaccinated and unvaccinated groups in order to observe the influence of vaccination on the cases treated with chemo-therapy as compared with corresponding ones in the control series.

Results

(1) The mortality rates on the control side with routine treatment were 85·7 per cent amongst the vaccinated and 88·2 per cent amongst the unvaccinated patients which were reduced as a result of chemotherapy to 68·1 and 79·1 per cent respectively, in the more fatal form of the disease *viz.*, its confluent variety. In the severe type *i.e.*, semiconfluent variety, the mortality rates on the control series amongst the vaccinated and unvaccinated patients were 25 per cent and 27·5 per cent which were brought down to 17·6 and 23·7 per cent respectively with chemotherapy. In the most mild and descrete forms of the disease the mortality rates on the control side amongst the vaccinated and unvaccinated patients were 3·9 per cent and 7·8 per cent which were reduced to nullity by chemotherapy. Thus the mortality rate is definitely lowered by chemotherapy. This fact is appreciably noted in the more virulent forms of the disease and relatively more so in the vaccinated than in the unvaccinated patients with all types of the disease. Again, the mortality rate was found lowered when administration of the drug was commenced early in the papular stage of the disease. (Tables I & III).

(2) The evolution of the eruption from papular stage to scab formation in small pox patients occurred earlier and the total period of the eruption was found to be shorter by a day or two under chemotherapy. The character of the rash under chemotherapy was also modified. When given in papular stage the vesicles become flatter, smaller in size, pustules looked less turbid and rather clearer, the scabs became thinner, and separated more easily without leaving raw ulcerating surface behind and the cicatrix appeared less pitted and more dried up than in the normal course of the disease without chemotherapy.

(3) The rash aborted in 32·1 per cent and 21·3 per cent of the vaccinated and unvaccinated patients respectively when treated with sulphonamides. This percentage was found to be increased most markedly when the drug was commenced in the early papular stage, *viz.*, by 53 per cent and 44·4 per cent respectively (Table I).

(4) The toxæmia of the disease was not appreciably affected by chemotherapy in this disease, but, it is found to be markedly less when the drug is commenced early in the papular stage, especially, in case of the more virulent form of the disease, *viz.*, the confluent variety of the disease.

(5) Septic complications were reduced from 17·7 per cent in the vaccinated and 32·1 per cent in the unvaccinated patients on the control side, to 13·1 per cent and 25·4 per cent respectively in patients under treatment with sulphonamides. This figure was further reduced by about 50 per cent and 25 per cent respectively when the treatment was commenced in the early papular stage. This fact reveals that chemotherapy can prevent septic complications common in this disease. Fatal bedsores have become very rare in the past 3 years since we have adopted chemotherapy in the treatment of this disease. (Tables I and III).

(6) Similarly, the lung complications were found to be reduced from 7·9 per cent and 20·2 per cent in the vaccinated and unvaccinated patients on the control side to 6·3 per cent and 15·6 per cent respectively in patients under chemotherapy and these figures were further reduced by 50 per cent and 25 per cent respectively when the drug was given early in the papular stage. (Tables I and III).

(7) The incidence of secondary or septic pyrexia was reduced from 79·6 per cent amongst the patients on control side to 50 per cent in patients treated by chemotherapy. (Table V).

So far, we have pointed out definite influence of chemotherapy on the eruptions, course, toxic and septic manifestations and mortality rates etc. in patients suffering from small pox.

We would now state some of the other interesting features observed during the present investigation.

It is known that small pox is one of the common infectious diseases that affect human beings in their childhood. From the age incidence of 548 patients of the present study, it was found that there were only 62 children under the age of 5 years, out of the total of 548 cases, *i.e.*, hardly 11·5 per cent of the total. Out of these 62 children under the age of 5 years, 3 children only were from amongst the vaccinated group *i.e.*, 4·8 per cent. The remaining children, *i.e.*, 59, were unvaccinated and their age incidence showed that nearly 25 per cent of them were infected before they reached 1 year. The mortality amongst children was considerably high as compared to that in adults. All confluent cases under 5 years had 100 per cent mortality rate while in the cases of semiconfluent variety it was 46 per cent as compared to 79·2 per cent and 35·7 per cent mortality rates respectively in similar varieties of the disease in adults. Amongst the vaccinated patients the disease showed low incidence from the age of 6 years till 16 years after which it showed its maximum incidence between the age groups of 16 years to 40 years. After the age of 40 years, again, its incidence fell as in the case of the group below 15 years. On the unvaccinated patients, on the contrary, the incidence of the disease was found to fall more or less equally in all age groups from infant age to adolescence with a marked rise, particularly, in the infancy and childhood. It, therefore, shows development of comparatively a fair degree of immunity to disease by primary vaccination amongst patients under the age of 5 years, which gradually disappears by the age of 11 years, and susceptibility to the disease reaches its maximum between ages 16 and 40 in the primarily vaccinated patients. (Tables II and IV).

This rise in the age incidence from childhood to adult age is seen only in the vaccinated group. This observation leads to other interesting findings in the course of present investigation, *viz.*, the influence of vaccination on the disease with or without chemotherapy.

The value of primary vaccination is shown by the fact mentioned above about the very low incidence of small pox amongst vaccinated children under the age of 6 years. As the maximum incidence of the disease amongst the primary vaccinated persons appears to be in the age group of 15-20-30 years, it shows that as a result of lack of sufficient immunity provided by primary vaccination after six years, previously immunised persons become susceptible to the diseases in the inverse proportion of the years after their primary vaccination. Hence, it is desirable to revaccinate the population in endemic zones at the school-going age of 5 to 6 years and again at the age of 15 to 20, *i.e.*, at the time of school-leaving age or when entering colleges or technical courses or services.

Vaccination or revaccination would prevent the occurrence of disease even in adult age and check outbreaks of the disease in epidemic form. Even partial immunity due to weak response of vaccination does definitely modify favourably not only the number, intensity and character of eruptions of this disease, but also the degree of toxæmia, incidence of different septic and other complications of various systems, and mortality rate of this disease. These results are illustrated by a greater proportion of descrete cases, lesser toxæmia, incidence of complications and mortality rates even in the semiconfluent or confluent varieties of the disease amongst the vaccinated than in the unvaccinated patients belonging to the present study. In all the groups and in different types of cases the mortality rate was higher in the unvaccinated than in the vaccinated cases. It was 30·9 per cent in the unvaccinated while it was 16·4 per cent in the vaccinated cases. Septic complications occurred amongst 32·1 per cent of unvaccinated and in 17·7 per cent only amongst the vaccinated. Lung complications were present in 20·2 per cent of unvaccinated against 7·9 per cent of the vaccinated. We have further observed that all these beneficial effects of vaccination were reinforced and enhanced by chemotherapy. Perhaps, previous vaccination helps patients suffering from this disease, just as does a specific serum, to reinforce beneficial effect of chemotherapy, *e.g.*, in pneumonia etc. The mortality rate and percentages of incidence of septic complications and lung complications which were 16·4 per cent, 17·7 per cent and 7·9 per cent without chemotherapy amongst the vaccinated were reduced further under chemotherapy to 14·2 per cent, 13·1 per cent and 6·3 per cent respectively.

Summary and Conclusions

1. The results of chemotherapy on small pox in 312 patients against those of routine symptomatic treatment of 236 patients are reviewed in order to find out definitely beneficial effects of chemotherapy on the patients previously vaccinated or otherwise as compared to the normal course of the disease in patients without chemotherapy and also to bring out interesting points as regards value of vaccination on the prevention of the disease, its modifying effects on the evolution and course of different stages of the disease, on the age incidence of the disease, its complications and mortality rate.

2. The sulphonamides attenuated the virulence of the virus as evidenced by reduction of toxæmia, abortion of the eruptions, and lowered mortality rate, particularly, in the more virulent type, *viz.*, confluent variety of the disease. The well-known fact that previous vaccination attenuates the virus was also confirmed by the present study. This attenuation was found to be further reinforced by chemotherapy in the vaccinated patients.

3. Chemotherapy shortens and modifies the course of the diesase by abortion of the rash especially where the drug is administered early in the papular stage of the disease. This effect is more pronounced amongst the vaccinated patients.

4. Attenuation of the disease by previous vaccination was seen by the fact that a considerable proportion of discrete variety of the disease associated with low mortality rate was seen amongst the vaccinated than amongst the unvaccinated patients.

5. The gradual waning of immunity after primary vaccination results in the maximum incidence of the disease amongst adults between age of 16 to 40 years in the vaccinated patients. The necessity of revaccination at school-going age and again at school-leaving age to reinforce the waning immunity after primary vaccination in infancy and first revaccination in childhood, to prevent incidence of the diesase even in elderly children and in adults and to modify the course and mortality of the diseases, is brought home by the findings in this study. Their importance is, as significant in these age groups as is that of the primary vaccination in infancy. Necessary legislation, if need be, is proposed in order to stamp out the epidemic outbreaks and to reduce the mortality of this endemic disease in thickly populated cities like Bombay in India.

TABLE I—SHOWING EFFECTS OF SULPHANILAMIDE IN ALL STAGES OF VACCINATED AND UNVACCINATED CASES

Variety	*Vaccinal condition*	*No. of cases treated*	*Mortality*	*Rash aborted*	*Maximum toxæmia*	*Septic complications*	*Lung complications*	*Average duration of rash*
Confluent:	Vaccinated	22	15 (68·1%)	7 (31·8%)	14 (63·6%)	3 (13·6%)	4 (18·1%)	3-4 days
	Unvaccinated	24	19 (79·1%)	6 (25·0%)	21 (87·5%)	7 (29·1%)	7 (29·1%)	4 ,,
Semi-Confluent:	Vaccinated	69	12 (17·6%)	21 (31·8%)	20 (28·9%)	15 (21·7%)	6 (8·7%)	3-4 ,,
	Unvaccinated	59	14 (23·7%)	13 (22·0%)	21 (35·4%)	17 (28·8%)	10 (16·9%)	3-4 ,,
Discrete:	Vaccinated	99	nil	33 (33·3%)	4 (4·0%)	7 (7·0%)	2 (2·0%)	3-4 ,,
	Unvaccinated	39	,,	7 (17·9%)	4 (10·2%)	7 (15·3%)	2 (5·1%)	4 ,,
Total:	Vaccinated	190	27 (14·2%)	61 (32·1%)	38 (20·0%)	25 (13·1%)	12 (6·3%)	3-4 ,,
	Unvaccinated	122	33 (27·0%)	26 (21·3%)	46 (37·7%)	31 (25·4%)	19 (15·6%)	4 ,,

TABLE II—SHOWING AGE-GROUPS IN THE SULPHANILAMIDE-TREATED CASES IN ALL STAGES

	upto 6 mo.		7 mo.-2 yr.		3-5 yr.		6-10 yr.		11-15 yr.		16-20 yr.		21-30 yr.		31-40 yr.		41-50 yr.		Over 50 yr.		Total	
Vaccinated:	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D
Confluent	—	—	—	—	—	—	2	1	1	1	10	6	5	4	3	2	1	1	—	—	22	15
Semi-Confluent	—	—	—	—	—	—	1	0	4	0	13	1	39	8	9	3	2	0	1	0	69	12
Discrete	—	—	—	—	1	0	3	0	4	0	34	0	37	0	18	0	2	0	—	—	99	0
Unvaccinated:																						
Confluent	—	—	1	1	4	4	1	1	3	2	7	6	8	5	—	—	—	—	—	—	24	19
Semi-Confluent	4	3	8	3	5	0	4	1	9	1	19	6	8	0	2	0	—	—	—	—	59	14
Discrete	2	0	5	0	6	0	8	0	5	0	10	0	3	0	—	—	—	—	—	—	39	0

TABLE III—SHOWING RESULTS OF ROUTINE TREATMENT OF VACCINATED AND UNVACCINATED CASES (CONTROL GROUP)

Variety	*Vaccinal condition*	*No. of cases*	*Mortality*	*Rash aborted*	*Maximum toxæmia*	*Septic complications*	*Lung complications*	*Average duration of rash*
Confluent:	Vaccinated	14	12 (85·7%)	—	9 (64·2%)	4 (28·5%)	3 (21·4%)	4-5 days
	Unvaccinated	17	15 (88·2%)	—	14 (82·3%)	8 (47·3%)	8 (47·0%)	4-5 „
Semi-Confluent:	Vaccinated	36	9 (25·0%)	—	11 (33·3%)	10 (26·1%)	6 (16·6%)	4 „
	Unvaccinated	29	8 (27·5%)	—	10 (36·2%)	12 (41·3%)	6 (20·6%)	4 „
Discrete:	Vaccinated	102	4 (3·9%)	—	6 (5·8%)	13 (12·7%)	3 (2·9%)	4 „
	Unvaccinated	38	3 (7·8%)	—	3 (7·8%)	7 (18·2%)	3 (7·9%)	4 „
Total:	Vaccinated	152	25 (16·4%)	—	26 (17·1%)	27 (17·7%)	12 (7·9%)	4-5 „
	Unvaccinated	84	26 (30·9%)	—	27 (32·1%)	27 (32·1%)	17 (20·2%)	4-5 „

TABLE IV—SHOWING AGE-GROUPS IN CONTROL CASES

	upto 6 mo.		7 mo.-2 yr.		3-5 yr.		6-10 yr.		11-15 yr.		16-20 yr.		21-30 yr.		31-40 yr.		41-50 yr.		Over 50 yr.		Total	
	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D
Vaccinated:																						
Confluent	—	—	—	—	—	—	—	—	1	1	7	6	4	4	1	1	1	0	—	—	14	12
Semi-Confluent	—	—	1	1	—	—	2	1	2	—	18	4	7	1	4	2	1	0	1	—	36	9
Discrete	—	—	1	0	—	—	6	1	2	0	42	1	41	0	6	0	3	1	1	1	102	4
Unvaccinated:																						
Confluent	3	3	2	2	1	1	—	—	1	1	5	4	5	4	—	—	—	—	—	—	17	15
Semi-Confluent	2	1	6	4	—	—	6	1	3	—	6	1	5	1	1	—	—	—	—	—	29	8
Discrete	3	—	3	1	4	—	4	—	8	1	5	—	1	0	10	1	—	—	—	—	38	3

TABLE V—SHOWING THE INCIDENCE OF SECONDARY FEVER

	Vaccinal condition	No. of Cases Treated	No. of Cases with 2ndary fever
Sulphonamide-treated Group:	Vaccinated	190	90 (47·3%)
	Unvaccinated	122	66 (54·1%)
		312	156 (50 %)
Control Group:	Vaccinated	152	117 (77·2%)
	Unvaccinated	84	71 (84·5%)
		236	188 (79·6%)

6. Chemotherapy reduced the incidence of septic complications such as, ulcers, abscesses, otitis media, corneal ulcers, bedsores, etc., and also the pulmonary complications such as bronchitis and bronchopneumonia. Previous vaccination helps in further reduction of all these complications.

7. The incidence of secondary pyrexia, its period and severity were reduced with chemotherapy, more so in the vaccinated patients.

8. By chemotherapy, the scabs become papery and superficial and after their fall they leave a clean healthy scar without much deformity. This effect was markedly noted in the vaccinated patients.

9. Chemotherapy shortens the convalescent period of the disease by abortion of rash, early formation of scabs with their early separation, and by prevention of complications. Hence, the convalescence was found to be less eventful under chemotherapy. These features were more noticeable in the previously vaccinated patients.

REFERENCES

CHAKRAVARTI AND GHOSH—*Indian M. Gaz.*. **76**:220, 1941.
CHARI, N. N.—*Ibid*, **77**:91, 1942.
KING, C. AND ROZARIO, K.—*J. Roy. Army M. Corps*, **71**:404, 1938.
MACCAMMON, W. C.—*J.A.M.A.*, **112**:1936, 1939.
MALLYA, B. G. AND CHATTERJI, B. C.—Report of the School of Tropical Medicine, Calcutta, 1940.
MOORE, D. F.—*Trans. Roy. Soc. Trop. Med. & Hyg.*, 33, 1940.
PATEL, T. B. AND NAIDU, B.—*Indian M. Gaz.*, **75**:1940.
PIERNA, S.—*J.A.M.A.*, **114**:931, 1940.
WILKINSON, P. B.—*Lancet*, **2**:67, 1942.

(*Continued from page 231*)

Congenital syphilis—Congenital syphilis is a preventable disease. So the treatment of congenital syphilis should be directed towards its prevention, which is the treatment and cure of acquired syphilis particularly in prospective parents and of the mother during pregnancy. However, if the disease had not been prevented, whether from no treatment or delayed or partial antenatal treatment, the baby should be treated for syphilis as early as possible. In sooth, the treatment of a congenital syphilitic child can and should be started within a few hours of its birth. The drugs used are the same as in the adults, arsenic, bismuth or mercury and iodide. Intravenous injection is difficult in the new born baby and so the arsenical commonly used is of the sulpharsphenamine series. The treatment is the combined intermittent method. The dosage depends upon the age and weight of the infant. Soon after birth the child can be given one centigram of sulpharsphenamine per kilo of body weight (2·204 lbs) and half that amount of bismuth. If mercury is used it is by inunction. The iodide is generally given in the form of syrup ferri iodide.

Another arsenical which is very commonly used in the continent, particularly in France and Germany, is a pentavalent compound—acetarsone (stovarsol in France, spirocid in Germany). It is a white more or less tasteless powder sparingly soluble in water or milk. The dosage differs with different workers and varies from 0·002 to 0·2 gm. per kilo of body weight per day. It is given by mouth. It is administered first in small doses to find out any susceptibility in the child. After deciding the optimum dose, it is administered daily, suspended in water, half an hour before the first feed. The course of treatment recommended by Muller (1930) extends over fourteen weeks divided into seven periods of a fortnight each. During each period acetarsone is given daily for the first ten days followed by rest for the remaining four days. He also advocates increasing doses of half to four tablets of four grains each (0·25 gm.) a day. The treatment should be stopped if the patient develops fever, vomiting, diarrhœa or rash.

(*To be continued*)

DR. K. S. RAY GOLD MEDAL FOR PAPER ON PUERPERAL SEPSIS

It is announced for information of the medical profession that the last date for receipt of papers on Puerperal Sepsis containing a record of original work and investigation on the subject for which a gold medal will be awarded by Dr. K. S. Ray, as ex-President of the Indian Medical Association, to the best worker at the next Session of the All-India Medical Conference to be held in Cawnpore during the coming Christmas holidays will be the 30th September, 1943. Research workers and investigators who intend to submit a record of their work on this subject are requested to send six typed copies of their articles to the undersigned so as to reach him by the 30th November, 1943.

P. B. MUKERJI,
Hony. General Secretary,
Indian Medical Association.

23. Hindusthan Buildings,
Calcutta.

STERILITY—ITS INVESTIGATION AND TREATMENT*

J. CHAKRAVERTI, M.B., F.R.C.O.G. (LOND.),
Professor of Obstetrics and Gynæcology and Hony. Visiting Obstetrician and Gynæcologist, Sir Kedar Nath Das Maternity Hospital. Carmichael Medical College, Calcutta.

Introduction

From ancient times the reproach for barrenness has been cast upon the wife, and the cause has been assumed to be some abnormality of her reproductive organs. Consequently the problem of sterility is assigned by tradition to the gynæcologist (Davis, 1934). It has been shown, however, within the past 25 years that not only do husbands share a lot of the responsibility for sterility, but that constitutional disturbances are causative factors almost if not quite as much as are local genital disorders. Hence a more preferable and impartial term for the condition would be sterile marriage or mating.

In spite of the various modern and artificial ways of living, the inherent desire of every human being to leave behind him his own progeny, is always there. It is far more so in women than in men. I believe still, that more women apply for the treatment of sterility than for advice in not having children.

When we talk of sterility, we generally mean primary sterility, which I am going to make the subject of discussion here. Other types of sterility are secondary sterility, one child sterility, habitual abortion etc., and each of these forms a class by itself. It would be too much and rather confusing to discuss all of them together under one head.

Incidence

It is very difficult to estimate the incidence of sterility. It varies within a very wide range. 10-15% of modern marriages are barren, hence the question is of considerable importance, and forms one of the social and economic problems of a nation.

In the Carmichael Medical College Hospitals, cases of sterility form 9 per cent of the gynæcological cases at the Out-patient Department.. In my private clinic, they constitute about 18 per cent of the gynæcological cases. Hence it would appear that sterility is more common among the rich and middle class who could afford private treatment than among the poor who form the bulk of hospital cases.

A review of the cases of sterility that attended my private clinic for treatment during the three years (1941-43) showed altogether 80 cases of primary sterility. A detailed study of these patients is given below.

Age—Table I gives the age incidence of these patients. It will be seen that their ages varied from 20 to 36 years. Two cases were 18 years old, and one 38. The average age was 25. Gynæcologists of other parts of the world would perhaps be amused to hear that women at the age of 20 applied for treatment of sterility. In a tropical country like India, particularly Bengal, the girls menstruate early at the average age of 13 years, marry early and become mothers early too.

* Based on an article read at a Clinical Meeting of the Bengal Obstetric & Gynæcological Society on March 7, 1941.

Table I—Showing Incidence of Age

Age groups	*No. of cases*
18—20	20
21—25	38
26—30	18
31—35	2
36—40	2
	80

In the course of the investigation by the author (Chakraverti, 1938) on the measurement of the pelvic outlet in primiparæ, it was revealed that the greatest number of first pregnancies occurred at the age of 18 years.

Religion—Table II gives the incidence according to the religion. I have clasified according to three main religious sects of India: Hindu, Mahomedan, and Christian. The Hindu group includes both Bengalee and non-Besngalee women, and the Christian group includes mainly anglo-Indians. This table, it must be admittted does not give any aboslute figure and a comparative study in this drection is not possible from this meagre data.

Table II—Showing the Incidence according to Religion

Religion	*No. of cases*
Hindu	74
Mahomedan	2
Christian	2

Province—Table III is an analysis according to the province which the patients belong to. Naturally, I had the opportunity to see Bengali patients more than women of any other province. This table is incorporated just to show that no province is exempt.

Table III—Showing Analysis of Cases according to Province

Name of Province	*No. of cases*
Bengal	58
U. P.	6
Marwar	1
Punjab	1
Nepal	1
Unclassified	3

Interval between Marriage and Treatment—The interval between marriage and the time of application for treatment of sterility was between 3 and 15 years, the average being 5 years. Table IV gives the data in detail.

Table IV—Showing the Interval between Marriage and the Time of Application for Treatment

Years after marriage	*No. of cases*
1—2	2
3—5	33
6—10	24
11—15	17
16—20	2
20—22	1

Natural Rate of Fertility

Before we actually take up the problem of sterility we should have an idea of the natural rates of fertility with reference to age, both in men and women: James Young's (1933) estimate is as follows:—

Women—Maximum fertility is from 20-25 years. There is a slow decline up to 35 years and a more rapid decline up to 45, after which births are rare.

Men—Maximum fertility between 20-30 years, slow decline upto 40, and more rapid decline thereafter. The power of procreation is longer in men than in women, extending up to 70-75 years.

It is a popular misconception always to attribute sterility to the female. According to Nurnberger, the male is directly responsible for one third of the cases and indirectly responsible for one third; while in the remaining third only could the cause of the sterility be attributed to the female.

Male Side of the Problem

Before a poor women is subjected to an intensive investigation for sterility, her husband should be examined from the point of view of his fertility. In hospital practice this is not possible, while in private practice others will bear me out when I say, that most of the husbands bolt when such an examination is suggested to them. Men are much more shy and chary of examination in this respect than women.

The question arises as to whether the husband should be examined by the gynæcologist. I should say yes, for at least a rough investigation of his place in the picture of sterility. An examination on the following lines may be made:—

(*i*) General examination; (*ii*) examination of testes and epididymis; (*iii*) examination of urine; (*iv*) examination of penis for deformities *e.g.,* hypospadias. (*v*) examination of semen (condom specimen) and lastly (*vi*) a general talk regarding the act of coitus and potency. If anything is found to be wrong with him, he should be referred to a physician, urologist, venereologist or surgeon as the case may be for necessary treatment while his wife is being investigated and treated.,

As regards the examination of the condom specimen of semen, the practitioner must not be satisfied only with information about the motility or non-motility of the sperms. He should ask the pathologist to provide him with the following information:—

(1) Quantity of semen—average 3-5 c.c., 0·5 c.c. is pathological; (2) consistency which should be gelatinous; (3) colour and smell (present only in pathogical specimen). (4) count, which should be 60-120 million per c.c.; (5) motility—80% normally motile within first 2 hours; (6) morphological characters of the sperms.

When pathological changes are noticed in any specimen, a second one should be collected after a sexual rest of a fortnight, and examined, before any opinion is expressed as to any permanent changes. This is necessary, as the sex organs exhibit a wide range of variation in function at different times and under various influences.

Female Side of the Problem

In investigating this side of sterility in Indian women, a gynæcologist must be very gentle, tactful and patient; because it involves many delicate questions relating to sex, about which she would be naturally shy to talk to a male doctor, till he had gained her confidence. Lady doctors are at an advantage to men in this respect. Experience and grey hairs are undoubtedly valuable assets to the male doctor in this field of work.

The most essential feature in the investigation of a case of sterility is thoroughness and completeness, in the sense that every ætiological possibility is routinely surveyed. Thus it can be stated definitely in each case that not only are certain factors present, but also and with equal certainty all other demonstrable factors are absent.

To quote the words of Meaker (1934), "the advantages of a complete diagnostic study of sterility are threefold: In the first place, it makes a research contribution, for the true importance of any single causative factor can be fully assessed only by a comprehensive analysis of all other combinations in which the factor occurs with others. Secondly, it eliminates much worthless and harmful treatment, and in particular such disasters as operations done for sterility upon wives of absolutely sterile men. In the third place, a complete diagnostic study, identifying every factor in the ætiologic sum total, points the way to treatment which is complete and therefore, more efficient."

Examinations

General: A careful medical and surgical history should be elicited, followed by a general examination. We may find general factors like chronic wasting disease, malnutrition and overwork, all contributing a share in the production of sterility.

Local Examination: *Introitus*—Congenital abnormalities may be present *i.e.,* imperforate hymen, atresia of the vulva or vagina, which fortunately are rare. Other abnormalities like inflammatory conditions, vaginismus etc., may be present at the introitus which may give rise to dyspareunia. In fact the patient may complain of this symptom more than of sterility.

Vagina—The length of the vagina, the nature of its walls, and the type of secretion should be noted. I have observed that in many sterile women, the vagina is either shallow, or conical like a tent, its walls smooth with very little rugæ, and the vaginal secretion scanty. Such a vagina is a poor receptacle for the seminal fluid.

The vaginal secretion is normally towards the acid side—pH 4 to 4·4, and this is inimical to the spermatozoa. The reaction in the vault of the vagina, however, is less acid, and definitely alkaline immediately after coitus. This may be due either to dilution with the cervical secretion or the seminal fluid. American gynæcologists believe that direct insemination usually takes place in coitus. If this is so, then the hostility of the acid lower vaginal secretion towards the sperms should not be of much account. However, if the acidity is persistently too high *i.e.,* less than pH of 4, its lowering before coitus is indicated by an alkaline douche.

The preconceived idea that gonorrhœa is directly responsible for a large percentage of female sterility has led to the

belief that pregnancy will not occur in the presence of gonorrhœal discharges. In practice, however, this has not been found to be quite true. On the contrary, it is surprising how often pregnancy could take place in the presence of bad infective discharges in the cervix or vagina, gonorrhœal or otherwise.

Cervix—A pin hole os, an elongated and conical cervix, or prolapse of the cervix are all unfavourable to conception. Grossly diseased conditions with a thick plug of mucus at the external os also prevents the ascent of the spermatozoa.

Normally, as I have mentioned before, the cervical secretion has about the same hydrogen ion concentration as the semen. Besides this, the cervical secretion has a chemiotactic affinity for the sperms. (Bourne and Leslie, 1939).

Examination of the cervical smear for gonococcus might be made, and if negative, repeated after a provocative injection of gonococcus vaccines (50 million organisms for a dose).

Uterus—Under-development of the uterus with or without displacement, as a rule, debars conception. Often one notices in a sterile woman, the disastrous combination of a small thin long uterus, associated with a pin-hole os and retroversion. Added to this if the patient has a shallow posterior fornix and associated menstrual irregularities indicative of endocrine imbalance, the outlook for pregnancy is not favourable. The uterus may be normal in size but bound down by adhesions and with the ovaries prolapsed. This is also unfavourable for conception.

The uterine index ½ (U-C) is a valuable guide in the prognosis of a case (Davis, 1934). A reading of 0·75 or higher indicates the normal condition in adults.

Tubes—Factors in the tubes conducive to sterility are mostly inflammatory as a result of chronic gonorrhœal infection. By reason of its destructive inflammation of the tubes and ovaries, gonorrhœa is perhaps the greatest single cause of sterility in women, constituting about 50 per cent of the cases.

Other factors in the tubes that may lead to sterility are abnormally long tubes, congenital atresia, abnormal peristalsis, and kinking associated with retroverted uterus and prolapsed ovaries.

Patency of the tubes should be investigated by the following methods: (*a*) Transuterine insufflation. This test is of both diagnostic and curative value *i.e.*, diagnostic as regards patency and curative because it might clear a slight blockage of the tubes.

Fallacies of tests (*i*) in positive result and (*ii*) in negative result.

Apparently positive tests may be obtained in chronic inflammation of the tubes, when air passes from one compartment of the tube to the other under pressure, as well as when air collects under vilamentous adhesions near the fimbrial ends. The fall of pressure in the manometer in either case is gradual in contradistinction to the sudden and sharp drop in a true positive test. The gargling noise in either case may be the same.

An apparently negative result may be obtained when air is suddenly pushed under pressure into the uterus which then undergoes sudden spasmodic contractions and as a result, the intrauterine part of the tube gets blocked. Hence the secret of eliciting a proper test for the patency of the tubes is slow and steady insufflation. An injection of atropine before the test helps in eliminating this error.

(*b*) Kymographic analysis. This is a more refined method of testing tube patency and explains various fallacies in the other tests because of its sensitiveness.

(*c*) Uterosalpingography. Patency of the tubes, obstruction if present, and its location can best be elicited by taking several films immediately after injecting some radio-opaque substance into the uterus. With the patient on x-ray table, an iodized oil which is a chemical compound of iodine and poppyseed oil (lipiodol) or other media are slowly instilled into the uterine cavity by means of an olive-headed Leur Syringe usually 5-7 c.c. of the fluid is instilled and with the cannula in position, films are taken at 5 minutes intervals. The patient is then sent to bed and another film is taken 20-24 hours after. If the tubes are patent the shadows of the fluid in the uterine cavity and tubes and its spilling into the peritoneal cavity will be seen on both sides. Deficiency of the shadow in one or both sides and its extent indicates obstruction and its location in the tubes. When no obstruction is present, the film after 20-24 hours usually records intraperitoneal lipiodol in small scattered irregular quantities in the vicinity of the distal ends of the tubes like a bunch of beads.

Postcoital examination of semen—(*a*) From the posterior fornix and (*b*) from the cervical canal.

The wife is seen within 2 hours after a natural intercourse and fresh materials are taken from the posterior fornix (seminal pool) and cervical canal with a pipette and examined microscopically with a view to the presence or absence of spermatozoa and the condition of those present.

There are three possibilities in postcoital examination of the semen (1) spermatozoa present and in every way normal (2) spermatozoa present and in some respect deficient, (3) no sparmatozoa at all.

In the first case it becomes obvious that there exists no fault of delivery and reception of the semen and that the endocervical environment is not hostile to the spermatozoa.

In the second case, a finding of spermatozoa few in number, imperfect, damaged or dead, indicates that delivery and reception have been accomplished but calls for differentiation between inadequate male production on the one hand and endocervical hostility on the other.

The third possible result, absence of spermatozoa in the fluid must be interpreted in the light of other tests *i.e.*, if the condom seminal specimen proves to contain normal spermatozoa, then there must exist either a fault in the delivery and reception of the semen or an extreme degree of endocervical hostility. If the semen shows azoospermia, then the basic trouble is either in the spermatogenic failure or a genital blockade in the male.

When however, one examination proves unsatisfactory, a repetition is usually indicated, as various technical accidents may interfere on any one occasion, even with perfect performance of coitus.

Endocrinal investigation—First of all the menstrual history must be gone into. Its onset, regularity and degree of flow all give an idea of the efficiency of the ovarian function and its maintenance of the fertile rhythm, which is so necessary for conception.

The general development of the patient should be noted, as well as the development of her secondary sexual characteristics. Endocrine disturbances like myxœdema, excessive obesity, acromegaly and pituitary deficiency if present, all conduce to sterility.

The uterus should be curetted in the premenstrual stage and the scrapings examined histologically. If they show the endometrium to be in the secretory phase, then the ovarian response is being well maintained *i.e.*, ovulation is followed by luteinisation. This is favourable for conception as being the normal ovarian cycle.

We are very poorly equipped here as far as laboratory experiments on animals are concerned, with reference to the hormonal estimation of the sex glands of women.

Low basal metabolism is an indication for the administration of thyroid.

Sex hygiene—Enquiry must be made regarding sex desire and satisfaction. The sex life from the view point of the wife is not always compatible with that of the husband *i.e.*, one of the partners may be more hyper- of hypo-sexual than the other, and allowance for this and adjustment must be accordingly made by mutual understanding and sex education. Enquiry also should be made if contraceptives had been used before and about the frequency of coitus and if dyspareunia is present.

All these methods are being described in detail not because we use them in every case of primary sterility but for the sake of completeness, so that in obscure cases the practitioner might refresh his memory as to what else should be done.

Below I present the salient features of my patients revealed through physical and other examinations. Table V gives the summary of my findings.

TABLE V—SHOWING THE CONDITION ON THE UTERUS, ADNEXA AND BREAST

UTERUS									ADNEXA			BREAST		
Size			*Position*		*Mobility*			*Function*						
Small	Bulky	Normal	Anteverted	Retroverted	Mobile	Not mobile	Restricted movement	Normal	Abnormal	Inflammation	No Inflammation	Tumour	Small	Developed	Getting small
13	4	63	40	40	51	6	23	22	58	20	55	5	12	56	12

TREATMENT

The essential point in the treatment is to remove all impediments in the quickest possible time. Again, it must always be remembered that there is often the possibility of a multiple causation of infertility. Hence, the treatment should always be complete. that is to say, it should in each case be directel against all conditions unfavourable to fertility simultaneously. This implies to simultaneous treatment of the husband as well whose role in the complexities of conception is by no means less.

Before the treatment is undertaken the party must be given a clear understanding that it would be a prolonged affair and that they must patiently persevere in it; more so in a case when a number of years of sterile marriage have already passed or when the pair have married late in life.

From Table V it will be apparent that the 80 cases of my series may be conveniently grouped as follows:—

I. Inflammatory (obstructive) .. 20
II. Non-inflammatory 55
III. Tumours 5

In group I, the inflammation varied from mere thickening of the tubes to the formation of tuboovarian masses of various size on either side. More often than not, the uterus was found retroverted and bound down in the Douglas pouch by the masses. Besides sterility, the patients suffered from congestive dysmenorrhœa, and constant discomfort or backache which was aggravated by menstruation, exertion and constipation. A good number of them had erosion of the cervix and suffered from leucorrhœa. These cases are obstinate and require prolonged treatment which, unfortunately, the patients do not often persevere in.

Treatment: Prolonged course of medical treatment including non-specific protein therapy, local applications and electrotherapy till all manifestations of infection disappear followed by tubal insufflation and if negative uterosalpingography for location of the site of obstruction and cauterisation of the cervix if pathological condition is still present. If the obstruction is at the fimbrial ends or ampullary portion of the tubes salpingostomy followed by tonic and endocrine therapy to dissolve the residual inflammatory condition. Lastly insufflation test is repeated. Husband should be treated at the same time. Injection of follicular hormone 3 or 4 days prior to ovulation and coitus helps conception in such cases. Of such operations as salpingostomy of the isthmial part of the tubes and implansation of the tubes in the uterus, I have no experience.

In the 55 cases in group II the majority had retroverted uterus with restricted mobility and many had prolapsed ovary also. Besides sterility, the other functional disturbances invariably present were dysmenorrhœa, irregular periods and dyspareunia. A few had the tent-like vagina, I have described previously. The remainder of the cases in this group had anteverted and anteflexed uterus, the size of which was invariably smaller than normal. The functional disturbances were scanty, irregular and painful menstruation. A few of them had the uterus anteverted, but lying in the hollow of the sacrum and a shallow vagina; one had a very narrow introitus demanding perineoplasty and two had pin-hole os. In none of this group were there any masculine type of women—I mean that they were feminine in the distribution of hair, character of the voice, and in the development of secondary sex characters. Many who were above the age of 25, complained of their breasts getting

smaller. Those that persevered with the treatment in this group, had D & C, and Rubin's tube test followed by Gilliam's and oophoropexy done, all in one sitting, according to the findings. The surgical interferences were preceded by endocrines, and followed by endocrines, vitamins and tonics. The results were very favourable and a large percentage became pregnant within 6 months to a year. A large number in this group had poor general health, and a weak constitution. In order to have effective and sustained action of endocrines, they were advised to take tonics and nourishing food containing balanced vitamins. Those that were stout or had a tendency to become so, had to curtail fats and carbohydrates in their diet and they were advised to fast twice a month—in the full and new moons.

Group III—These cases did not actually come in for sterility but for other symptoms *i.e.*, menorrhagia or metrorrhagia, the feeling of having a tumour, and discomfort. In the course of investigation they were found to be nulliparous. Whether sterility was the cause or effect in these cases was very difficult to surmise. They had mostly fibroid tumours and came in a condition unsuitable for myomectomy, except one. She had morning sickness and enlargement of breasts with nourishment. The uterus was uniformly enlarged to 12 weeks pregnancy size, antevertel and freely mobile with scanty and regular menstruation. She had to be observed carefully for over a month before the diagnosis of a fibroid was confirmed. It was then found to be suitable for myomectomy but the patient, who was anxious for a child, refused operation as she had a strong conviction that she was pregnant. When this notion was finally expelled, she had to wait 10 months for the permission of her husband who was on active service in the Middle East. By this time, the tumour had grown and distorted the uterus in such a way that myomectomy was out of the question and hysterectomy had finally to be resorted to. Soon after the operation the enlargement of the breasts went down and the nourishment dried up. She had dropped beats in the heart which also disappeared before she left the nursing home. So a considerable percentage of fibroids are associated with sterility.

Besides these cases in the series under review many patients seek advice for treatment and they may be further classified under the following groups, *viz.*, (1) cases with deficient ovulation, and (2) cases with faulty delivery and reception of semen.

Group IV—Cases with deficient ovulation: Established genital hypoplasia in an adult female is not directly curable. But premature retrogression timely tackled may be prevented. Anovulatory menstruation usually occurs more frequently in women with definite menstrual disturbances. Administration of thyroid in addition to ovarian hormones in these cases is indicated. The effect of thyroid as an adjuvant or curative measure for sterility is only demonstrable when there is a definite lack of thyroid. A means of stimulating the germ elements of the ovary lies in small doses of x-rays. In 1915 Van de Valde, as quoted by Delee and Greenhill (1941), showed that such doses would establish menstruation in certain cases of amenorrhœa. Such operations as partial oophorectomy, decortication, extroversion etc., had been performed in order to improve ovulation. These operations should not be undertaken unless the husband side of the problem has been thoroughly dealt with effectively.

Group V—Cases with faulty delivery and reception of semen. This may be due to: (1) defect in the wife; (2) defect in the husband; (3) defect in the knowledge of sex intercourse.

After correcting the defects in both the partners they should be educated properly in sex hygiene. Both husband and wife should be advised in the right process of sexual intercourse which to be effective should be in the fertile period of the wife's menstrual rhythm. The husband should also be told to be as patient as possible in the act of coitus. He should not overwork in the day time, if he wishes to procreate. A change on the hills or the sea side often brings about marvellous change on the sperm of a man overworked in artificial town life. The behaviour of the wife for some time soon after intercourse is also important, *i.e.*, she should remain in the recumbent posture for at least a couple of hours to enable the sperms to have as easy an access into the uterine cavity as possible.

On rare occasions, one comes accors cases in which no cause could be detected: At the same time neither the husband nor the wife is absolutely sterile. Of all the animals, human beings are the poorest breeders. Perhaps due to Nature regulating the process in the case of other animals, while relaxing and giving man the power of controlling his own rate of procreation.

These cases, where no cause could be found and who at the same time are not absolutely sterile, are partners of low fertility. As is well known, in the case of demise of one of the partners, the other may get children after remarriage with a person of higher fertility. These cases as a rule do not improve well by any treatment. Let to themselves, they may now and again, after many years and under stimulation not known to us, begin to ascend in the ladder of fertility.

Such extreme measure as artificial insemination using either husbands' or donors' semen, I have had no occasion to employ. In America, particularly in New York City, artificial insemination has been widely practised by Frances. I. Seymour and Alfred Kœner (as quoted by Delee and Greenhill, 1941) with considerable success. One great drawback of this measure is that it requires repetition over a long period. In some cases almost monthly inseminations for more than 3 years were required before pregnancy resulted.

Case Report*

The case described below is of considerable interest, and importance from the point of view of investigation and treatment of sterility.

Mrs. L. G., a Bengali Hindu, aged 23, came under my care for dysmenorrhœa and sterility on 20-10-41. She attained puberty at the age of 11. The periods were regular, lasting 2 to 3 days, scanty dark coloured, with occasional small clots and painful from the very beginning. She was married at the age of 12, but never had a child. She was healthy and well nourished.

Previous history—On 19-8-40 she was admitted into my ward at Sir Kedarnath Maternity Hospital of the Carmichael Medical College Hospitals for acute abdomen, and in a bloodless

* The reports of the other 79 cases, mentioned in this series, were submitted by the author, but could not be published for want of space.—Ed., *J. Indian M. A.*

condition. She was operated on as an emergency case for ruptured ectopic pregnancy in the isthmial part of the right tube, which was removed. She was given auto-transfusion 2 pints. The operation notes disclosed that the fimbrial end of the left tube which was preserved, was closed. As it was a life saving emergency operation, the principle of "quick in and quick out" was observed and no attempt was made at restoration of the patency of the conserved tube.

The abdominal scar which was a right paramedian one, was healthy and firm. P.V.—outlet healthy; vagina. roomy; rugæ marked; no abnormal discharge present; cervix was healthy and nulliparous; uterus was normal in size, retroverted, and with restricted mobility. The left tube could not be papated. On 17-10-41 she was admitted into the Carmichael Medical College Hospitals and operated on 20-10-41—Dilatation, Rubin's insufflation test and curettage were done. The tube test was negative. The endometrium was healthy and corresponded to the phase of the menstrual cycle.

On 22-11-41 uterosalpingography was done and it was noted that the obstruction was near the fimbrial end. The uterine shadow was uniform in outline. On 6-12-41 she underwent a second abdominal operation, when left salpingostomy for restoration of the tube patency and Gilliam's ventral suspension for the retroverted uterus were performed. Three days before her discharge from hospital *i.e.*, on 27-12-41 tube test was again performed, but to my disappointment, it was negative. She was prescribed œstrogenic factor of the ovarian hormone in the form of ovocyclin and a course of milk injections for the resolution of the residual inflammation.

The husband who was 30, at this stage of the proceedings admitted to having contracted a mild attack of gonorrhœa a couple of years back. He had no discharge, and the urine examination showed no abnormality. Prostatic massage, however, disclosed plenty of pus cells and a few gram-negative cocci. He was prescribed sulphapyridine and advised to observe abstinence.

On 15-3-42 tube test was again done with a doubtful positive result. The patient was advised to continue endocrine and vitamin E (Ephynal).

On 7-7-42, tube test was repeated. This time it was definitely positive. Her menstruation also became very regular, free, profuse and painless, which contributed a very hopeful sign.

The husband by this time, was apparently free from infection, and his condom specimen of semen was examined. It was scanty in amount and showed very few sperms, most of which were is a necrotic condition, so much so that their morphological character could not be studied (necro—and oligo spermia). On enquiry, it was found that he was doing over time for nearly 18 hours a day in a gun factory. He was prescribed tonics and testicular hormone, and forbidden to do any more over time. After 5 months' treatment on these lines, his semen was examined again. It was now found to be quite normal with the sperms in a virile condition.

On 20-11-42 tube test was repeated once more, and this time found to be positive only at 60 mm. pressure, leaving no more doubt as to the patency of the tube.

From the beginning of 1943 they were both advised to resume intercourse especially during the fertile period and to observe sex hygiene before and immediately after each coitus.

On 21-11-43 the patient came back with a history of having missed a period and with nausea. Examination showed a soft and bulky uterus with softening of the cervix and discoloration of the vagina. She was prescribed corpus leuteum extract, and vitamin E, and asked to come for a re-examination after a month. She is now attending the ante-natal clinic regularly and is in her 7th month. The fœtal heart sounds and movements are normal and it is hoped she will continue to term and have a safe confinement.

This case is an example of how a multiplicity of factors could play a part in the causation of sterility. It requires perseverance on the part of both husband and wife, and their combined co-operation with the doctor for the achievement of success in the treatment. The patient I have described was not highly educated nor was she illiterate, as she used to send reports of her condition through her husband in writing, she living in a village near Barrackpore 15 miles away. She was quite intelligent and more so than her husband.

Acknowledgment

My thanks are due to the Superintendent, Carmichael Medical College Hospitals for kindly allowing me to publish this case.

References

Davis, Carl Henry—Gynæcology & Obstetrics, 1934. W. F. Prior Co. Inc. Maryland., Vol. III, Chap. IX, p. 1.

Idem—*Ibid.*, p. 19.

Young, J.—Text Book of Gynæcology 3rd Edition, 1933 A. & C. Black Ltd. London, p. 101.

Meaker, Samuel R.—Human Sterility, 1934, William & Wilken Co. Baltimore.

Bourne Aleck and William Leslie—Recent Advances in Obstetrics and Gynæcology, 4th Edition, 1939, J. & A. Churchill, London. Chap. IX, p. 85.

Idem—*Ibid.*, p. 193.

Delee Joseph and Greenhill, J. P.—Year Book of Obstetrics 1941. Yeak Book Publishers, p. 360.

Chakraverti J.—A Study of Measurements at the Outlet of the Pelvis—Proceedings of the 2nd All-India Obstetrical and Gynæcological Congress, Bombay, 1938, p. 234.

SPECIAL ARTICLE

PSYCHOSOMATIC ASPECTS OF GASTRO-INTESTINAL DISORDERS

HENRY J. WEGROCKI,* M.A., PH.D. (COLUMBIA) M.B., M.D. (MINNESATA), CAPTAIN.

Medical Corps, United States Army Air Forces

INTRODUCTION

The role of psychiatric factors in gastro-intestinal disorders can be better appreciated if we view the matter in the light of historical perspective. Much is spoken today of contemporary political ideologies, of the ideology of fascism, communism, of democracy, but medicine itself is not devoid of certain dominant ideologies. The ideological concept which has dominated medicine in its early stages of development, and still does to a great extent today, assumed that a disease is essentially the outward manifestation of a microscopically demonstrable disorder. This view was perhaps best typified by Virchow to whom the essence of pathology lay in microscopic cellular changes. Where any sort of pathology was present, it was assumed and claimed that it could eventually be microscopically demonstrated. The fundamental idea underlying this emphasis was exemplified by Virchow's statement that there are no general diseases but only diseases of the organs, of the cells (Alexander, 1939).

Psychiatry in the early stages of its development, was held back by the stultifying effect of this concept. Research workers attempted to apply this concept to the psychoses, but where it succeeded in showing cortical changes in paresis, it failed to demonstrate any consistent organic pathological changes in the far more numerous schizophrenias and in the manic-depressive psychoses. Gradually, under the influence of Freud in Europe, and Adolph Meyer and his psychobiological school in the United States, psychiatry emancipated itself from this atomistic viewpoint, and took it as its problem to investigate the total person in relation to himself and his environment. Although it admitted the influence that constitutional predisposition might play in furnishing a favourable anlage for certain abnormal mental reactions, it emphasized the role of the personality acting and reacting in various kinds of unfavourable environments. This viewpoint, consequently, has become in the past three decades, the dominant psychiatric attitude toward the psychoses and neuroses.

Since the First World War, but particularly during the past decade, there has developed a trend to apply this psychiatric concept to a wide variety of medical problems. The presumption that the total person with his environment, past and present, rather than merely damaged cells or organs, determines a great deal of abnormal organic reaction, has become the key motto of a movement which designates its sphere of interest as "psychosomatic medicine"—a point of view which emphasizes that the soma, the body, and the psyche, the personality, are indissolubly bound and are expressions of an underlying unity. This unity is conceived of as being mediated by the central and autonomic nervous system and the endocrine glands. It is interesting that ancient Hindu philosophy, though based on fundamentally different assumptions, expressed through its concept of the *prakriti* an affirmation of the unity of the psychic and physical and predicated its Yogic techniques for the achievement of *samadhi* on a denial of the dualism of the psyche and soma.

The field of gastro-enterology has been particularly subjected to an analysis from the psychosomatic viewpoint, with the attempt being made to demonstrate the psychological factors present in many of the disorders of the gastro-intestinal tract. The psychological factors are pictured as acting primarily through the agency of the autonomic nervous system with its sympathetic and parasympathetic branches. Since the autonomic nervous system is hypothalamically controlled, the role of the hypothalamus, acting under cortical influences, has been emphasized in all clinical syndromes associated with functional digestive disorders.

We can best realize the role of psychological factors in gastro-intestinal functioning if we think of those instances in everyday life where this relationship seems rather evident. Appetite, for example, is essentially a gastro-intestinal function, yet we can easily see how it can be affected by factors in the external environment. A meal, attractively prepared on a clean tablecloth, will have a stimulating effect. A meal on a greasy dish with a dirty tablecloth is more apt to have the opposite effect. This negative reaction may go even further; the man who has just been informed that his services will no longer be required at his office job may feel nauseated at the idea of food; the lady, and this is an actual example from clinical literature, may vomit on discovering her husband with another woman in a restaurant! All the above are mostly instances of the effects of an *acute* type of psychological tension. Tensions, however, may also be *chronic in nature*. Thus continued anxiety and fear, reaching a peak point, might produce malfunctioning of other parts of the gastro-intestinal tract. Diarrhœa, constipation, and abdominal cramps might, for example, be strongly present in the medical student taking final examinations which will determine his entire future career. Cramps, due to psychological tensions, may occur at many levels of the gastro-intestinal tract; they may be at the cricopharyngeus, in the œsophagus, at the cardiac or pyloric ends of the stomach, in the entire gastric musculature, in the colon, or at the anal sphincter. Faulkner (1940) gives a particularly interesting example of the effect of psychological factors in the case of a severe œsophageal spasm. In using an œsophagoscope, he had great difficulty in inserting it into a patient. He states: "Attempts at withdrawal were even more difficult than the introduction of the instrument. The œsophageal muscles clasped the instrument tightly and would not let go. The withdrawal of the œsophagoscope even as little as one centimeter demanded considerable strength." "As the operative difficulties increased it occurred to me that here was an opportunity to determine whether the degree of œsophageal spasm could be altered in any respect by the patient's mental outlook. Accordingly, while still looking down the œsophagoscope, I suggested to the patient that it was very probable that we could arrange work for him which would bring social and

*On military leave from St. Elizabeths Hospital, Washington, D.C.

economic security. To my utter amazement the spasm relaxed immediately and the œsophagus opened to normal size." To test whether this relaxation was mere co-incidence, "I then asked how he would like to think of a future with even greater poverty and insecurity than that in which he now was living. And promptly therewith, the spasm returned. I repeated this experiment several times and noted alternating spasm and relaxation, depending upon the emotional and functional response to the environment pictured." From the above examples we can easily observe the ready responsiveness of the gastro-intestinal tract to psychological factors. As a further inference from this, we can also see how, constantly present, tension-producing circumstances might bring about a chronic malfunctioning of the gastro-intestinal tract.

Abnormally acting psychological factors can be productive either (*a*) of changes in the gastro-intestinal tract itself (*e.g* peptic ulcer, mucous colitis) or (*b*) of changes elsewhere in the body, due to a disturbed psychophysiological relationship indirectly involving the gastro-intestinal tract. This latter picture can be illustrated in two antithetical clinical syndromes: obesity and anorexia nervosa. While it is granted that some cases of obesity are due to an inherited constitutional predisposition, many internists have noted that the over-eating that so frequently occurs in obesity, often takes on the character of a compulsion neurosis. Thus, the over-eating is an abnormal compulsive phenomenon and not necessarily the result of an ungovernable appetite. Since, from a purely descriptive point of view, a compulsive habit may be psychiatrically regarded as representing a tension-release mechanism, we may infer that the over-eating in certain cases of obesity represents a means of escape from unresolved emotional tensions. As a further inference, we cannot escape the conclusion that selected cases of obesity would be susceptible to a psychotherapeutic approach.

Anorexia Nervosa

The clinical syndrome of anorexia nervosa, externally at least, represents the diametrical opposite of obesity. This picture present almost entirely among adolescent girls, is characterized by a loss of appetite, which on analysis is usually found to be caused by an unconscious disgust with food (Rahman *et al*, 1939; Waller *et al*, 1940). Because of low food-intake, emaciation and constipation are always present; the endocrine picture of amenorrhea is typical of this syndrome. Paradoxically, there is always present a low basal metabolic rate with an abnormally large, rather than as one would expect, an abnormally small, energy output. An investigation of the psychological circumstances associated with this condition reveals the fairly constant presence of certain factors. There is always present a very definite conflict with the family. The patient may feel that she is being discriminated against, that the family has no affection for her. Frequently, she has some slight tendency towards obesity and is ashamed of being fat. The hypothetical normal person might not react to this with anorexia, but the patients concerned usually have a strong neurotic background. A social-psychiatric investigation usually reveals the presence of neurosis and even psychosis among the patient's parents and near blood-kin. The patient herself derives a great deal of neurotic gain from the picture of helplessness which she presents. She is usually shown far more attention than she had ever received before and she does not care as a rule to cease being the focus of attraction. The fact that most of these cases occur in the post-pubertal period would lead one to suspect that the condition is somehow associated with the stresses and strains of adolescence. Actual investigation has revealed this to be true and in many analyzed cases it has been found that food itself had an unconscious sexual significance to which the patient would react with disgust.

Previous to the psychosomatic approach to anorexia nervosa, the atomistic point of view had been applied. It was claimed by many that anorexia nervosa represented essentially a form of Simond's disease (pituitary cachexia), a condition which it simulated very closely. However, the determinative x-ray findings have always been negative. Some men have, therefore, resolved the conflict by stating that anorexia nervosa is a functional Simond's disease in which psychological factors operate *via* the cortex to produce changes in the hypothalamus.

Peptic Ulcer

Whereas in the case of obesity and anorexia nervosa, the hypothalamus is presumed to act only indirectly, it has been shown inferentially, that in the case of peptic ulcer and mucous colitis the hypothalamus exerts a more direct effect on the gastro-intestinal tract through the autonomic nervous system. The psychosomatic point of view assumes that peptic ulcer is caused by hyperactive autonomic functioning (Heide, 1940). Here the autonomic nervous system, due to hypothalamic overstimulation, brings about a hypersecretion of the gastric mucosa and a hypermotility and hypertonicity of the gastric musculature which consequently cause a local anæmia of the gastric mucosa, making it susceptible to self-digestion. Experimentally, this has been demonstrated by Cushing (1932) and Watts and Fulton (1933) who produced multiple hæmorrhagic lesions in the gastric mucosa of monkeys through hypothalamic injuries.

Psychological investigation of the personality patterns of patients with peptic ulcer has disclosed the frequent presence of a typical personality configuration. Patients of this type are found upon analysis to manifest almost uniformly a repressed desire for passivity and a non-competitive type of existence which is associated on the other hand with a struggle for success and accomplishment. An individual of this sort derives his motivation chiefly from his family and his immediate early environment. The striving for success, in this case, does not, therefore, represent a sincere inner drive but a motive externally implanted in him and unconsciously resisted by him.

Many internists have commented in the past on the presence of psychological factors in the etiology of peptic ulcer. Eustermann of the Mayo Clinic (1939) states, "In peptic ulcer the causative factor operative in most cases is the psyche, mediated through the autonomic nervous system." Chappel and his co-workers (1937) have attempted a therapeutic test of the psychosomatic origin of peptic ulcer. Using matched control and experimental groups of patients, they utilized group psychotherapy *plus* the usual ulcer regime in the case of one group, and only the usual symptomatic ulcer therapy in the case of the other group. Chappel asserts that there was a definitely observable greater improvement in the case of the experimental group over the controls after three years of therapy. The Tavistock Clinic of London (Davies and Wilson,

1939) in making a study of emotional factors in peptic ulcer, investigated 205 unselected cases. They found that in 84 per cent of the patients the symptoms began after some incident which strongly affected their sense of emotional security. Since it might have been said that a similar picture could obtain in any group of ill individuals, a number of cases brought into the hospital for treatment of hernia were studied. It was found in this group that, in 22 per cent of the cases, complaints referable to the hernia occurred at times when the patients had experiences affecting their sense of personal security. We can infer from this that in the case of the peptic ulcer patients the relationship between the onset of symptoms and emotional trauma was not a chance one but an actual one.

Mucous Colitis

The syndrome of mucous colitis also shows a definite relationship between the onset of the clinical picture and the chronically present abnormal psychological factors. Symptomatologically, mucous colitis is usually characterized by the presence of constipation followed by diarrhœa, abdominal cramps and the passage of mucous casts in the fæces. This symptom-complex has been particularly studied by Cobb, White and Jones (1939), although many previous observations have been made on the psychiatric nature of this disorder. Da Costa in 1871 studied seven patients and noted a definite relationship between mucous colitis and the presence of emotional tensions. Hurst (1917) during the First World War, noted that mucous diarrhœa was very often present in individuals with "soldier's heart". Cobb's impetus to the study of mucous colitis was the consequence of an observation involving a Catholic Italian doctor and a Protestant New England young lady. They fell in love with one another and wished to be married. However, when the young lady informed her parents of her marital choice, they replied not only with disapproving but even with threatening letters. As a consequence of this, she developed a severe mucous diarrhœa. This was present every day until the day of her wedding when she received a message from her parents that they had changed their minds and that they would be glad to receive her husband into their family. From that day on her mucous diarrhœa disappeared entirely.

Cobb, White and Jones (*loc. cit.*) from their study of mucous colitis note that it is very frequently misdiagnosed. It is often confused with cholecystitis, peptic ulcer and appendicitis. The determining diagnostic finding is the sigmoidoscopic picture. This, while characteristic of mucous colitis, is not specific since it is found in any case of long continued irritation of the colon; therefore, a differential diagnosis from other conditions causing chronic irritation must be made. The psychosomatic school pictures mucous colitis as being due to a hyper-irritability of the sigmoid colon with the parasympathetic system acting as the intermediate agent. Since the parasympathetic system acts by releasing acetylcholine, it was decided to see whether experimental ingestion of large amounts of this substance could produce a sigmoidoscopic picture similar to mucous colitis. The subjects were several medical students who took massive oral doses of acetyl-beta-methylcholine. Sigmoidoscopic examination revealed a picture almost identical with that of mucous colltis. Experimentally then, as well as hypothetically, it does seem justifiable to assume that mucous colitis is caused by parasympathetic overactivity of the sigmoid.

Several neuropsychiatric factors were found by Cobb to be usually characteristic of mucous colitis patients. They all manifested general nervous excitability and on the exercise test of vascular stability most of them showed a definitely low score, testifying to a presumed autonomic instability. The energy output of the patients was definitely below normal; they tired easily and required more than normal amount of sleep. All manifested a diminished sexual libido; two-thirds of the women were sexually frigid while most of the men seemed satisfied, if at all, with very infrequent sexual relations. Psychologically, the patients showed certain specific personality characteristics. Chief among these was an over-conscientiousness, amounting almost to compulsiveness. These individuals would never be certain whether what they did was quite the right thing or not. As a result, they would tend to develop anxiety reactions about even the simplest acts. Another characteristic was a very strong dependence upon the opinions of others; if they imagined that their actions offended the standards of other individuals, they would develop strong guilt reactions. Underlying these two tendencies was an extreme sensitiveness which could easily produce resentment if the patients were in any way opposed by other persons in the environment. The anxiety, guilt and resentment present in these individuals would, therefore, be productive of emotional tensions which when translated into a hypothalamic over-stimulation of the parasympathetic nervous system could, under suitable conditions of favorable anlage and chronicity of excitation, result eventually in the clinical picture of mucous colitis.

Summary

In summary, the psychosomatic point of view with regard to gastro-intestinal disturbances is that, where such factors as malignancy, toxicity, infection, and vitamin or hormonal deficiencies can be excluded, the meaning of a gastro-intestinal disorder should be sought rather in the faulty psychological adjustment of the individual than in the local physiological and tissue disturbances of the gastro-intestinal tract.

References

Alexander, F.—*Psychosom. Med.*, **1**:7, 1939.

Chappell, M. N., Stefano, I. J., Rogerson, D. S., and Pike, F. H.—*Am. J. Digest. Dis.* **3**:813, 1937.

Cobb, S., White, B. V., and Jones, C. M.—Psychosom. *Med.* Monograph 1, Published by Williams & Wilkins Co., Baltimore, Maryland, M.S.A., p. 103, 1939.

Cushing, H.—*Surg. Gynec. & Obstet.*, **55**:1, 1932.

Da Costa, J. M.—*Amer. J. Med. Sc.*, **61**:2, 1871.

Idem—Ibid, **89**:321, 1871.

Davies, D. T. and Wilson, A. T. M.—*Lancet*, **2**:1353, 1937.

Eustermann, G. B.—*J. Med. Sc. N. J.*, **36**:369, 1939.

Faulkner, J. W.—*Psychosom. Med.*, **2**:398, 1940.

Heide, C. van der—*Psychosom. Med.*, **2**:1940.

Hurst, A. F.—Medical Diseases of the War. Edward Arnold, London, 1917.

Rahman, L., Richardson, H. B. and Ripley, H. S.—*Psychosom. Med.*, **1**:335, 1939.

Waller, J. V., Kaufman, M. R. and Deutsch, F.—*Ibid.*, **2**:3, 1940.

Watts, J. W. and Fulton, J. F.—*Ann. Surg.*, **101**:363, 1933.

MEDICAL PREPAREDNESS SERIES*

THE MODERN TREATMENT AND PREVENTION OF VENEREAL DISEASES*

V. GOVINDAN NAIR, M.R.C.P., F.R.F.P.S.,
Venereologist and Dermatologist, King George Hospital, Vizagapatam.

(*Continued from previous issue*)

For convenience the treatment is discussed under three headings—general, local and specific.

General treatment. Improve the general health of the patient; live in healthy well ventilated houses with good sanitary surroundings; keep regular hours; take regular exercise and ensure sufficient sleep; avoid worry and excesses in everything; eschew alcohol and use tobacco only in moderation. Sexual intercourse should be forbidden and pregnancy must be avoided. No restriction in diet is required. Bowels must be kept regular and the skin active. If the patient is not showing good response to the specific treatment, stop it and prescribe appropriate tonics.

Local treatment. Chancre. No antiseptics should be applied before diagnosis; after diagnosis no special treatment is required for chancre. Specific treatment resolves it. If thought necessary calomel ointment may be applied externally or a powder consisting of equal parts of calomel and calamine may be dusted. For mouth lesions a gargle is advisable, such as two per cent potassium chlorate, alum or borax or hydrogen peroxide 1 in 20. For mucocutaneous lesion like condylomata, dust with a powder containing equal parts of calomel and calamine. Cutaneous lesions do not require any special treatment except the pustular conditions like rupia in which a potassium permanganate bath 1 in 10,000 may be useful.

Specific treatment. The drugs that are commonly employed are arsenicals, bismuth or mercury and their compounds and iodides.

Arsenic is available in the form of trivalent and pentavalent compounds. The trivalent compounds are salvarsan, arsenobillon, kharsivan, arsphenamine, neosalvarsan, novarsenobillon, neokharsivan neoarsphenamine etc., myosalvarsan, sulfarsenol, kharsulphan, sulpharsphenamine, thiosarmine, thiarsin, sulpharsamin etc.

The pentavalent compounds are; tryparsamide, acetarsone, stovarsol or spirocid.

Mapharside or mapharsen of U.S.A., an arsenoxide compound is very much in use now in United States of America but less commonly in other parts of the world.

As already stated, Ehrlich and Hata synthesised salvarsan in 1909. It is a yellowish, crystalline, hygroscopic powder containing about 31% of arsenic. It is very unstable when exposed to air and is not soluble in water. Similar preparations were then made in other countries such as arsenobillon in France, kharsivan in England, arsphenamine in America, etc. Because of its insolubility in water, its solubility in acids and of its difficulty of admnistration, Ehrlich later synthesised another substance, the result of his 914th experiment, and named it 914 or neosalvarsan. Later similar compounds were manufactured in other countries. It is also an yellowish powder with 22% arsenic, readily soluble in water but more easily oxidised when exposed to air than its precursor. Salvarsan is more potent than neosalvarsan but gives rise to more toxic reactions. To-day the neosalvarsan series have completely taken the place of the salvarsan series which are seldom used except in America. The neosalvarsan series are administered intravenously by means of a ten c.c. syringe. The drug dissolves readily in water producing a neutral solution. Larger solutions are always preferable, ten to twenty c.c. being a convenient volume. The solvent ordinarily used is cold double distilled sterile water.

The arsphenamine series produce necrosis of the tissues when injected subcutaneously or intramuscularly. The neoarsphenamine series give rise to tremendous pain, swelling and discomfort at the site of injection, at times going on to abscess formation. To obviate this difficulty the sulpharsphenamine series were introduced for administration into the tissues. For subcutaneous and intramuscular injections the bulk of the solution should not as far as possible exceed 3 c.c. To reduce pain different solvents are used—creocamph which melts at 15°C or a solution containing one part guaicol, 50 parts glucose and 100 parts sterile double distilled cold water. This drug is particularly useful in the treatment of children, debilitated old patients and those in whom an intravenous injection is contraindicated due to other causes.

Rules for the use of arsenic. Never use an arsphenamine exclusively. Never use an arsphenamine insufficiently, *i.e.*, in a single short course. Never use an arsphenamine when there is reason to fear either therapeutic shock or therapeutic paradox. In these cases always prepare the way with a heavy metal. Never use arsphenamine in a therapeutic test for diagnosis (Stokes, 1936). In this country never follow the dosage given in foreign text books. The ordinary Indian patient is undersized, underweight, underfed and often unfed.

Bismuth. Livaditi and Sazerac introduced bismuth salts in 1920 for the treatment of syphilis. For dramatic effect there is arsenic, but for prolonged effect bismuth is superior. Bismuth has fairly good spirochæticidal property and it has prolonged and continuous action. It also promotes tissue resistance. It has been experimentally proved that even a small quantity of bismuth in the system inhibits the development of syphilitic lesions. Bismuth is never given intravenously. It is administered intramuscularly. Inunction of bismuth is found to be of no value. There is a preparation of bismuth, sobisminol, which can be administered by mouth and said to be effective. The number of bismuth preparations in the market is legion. Their names do not give any indication of their bismuth content, their absorbability or their therapeutic effects. They may be classified as follows: water soluble, water suspended, oil soluble, oil suspended, water soluble and oil suspended combination and a combination of bismuth and arsenic.

For the routine bismuth therapy in combination with an arsphenamine, use an oil suspended or water insoluble preparation such as the salicylates or injectio bismuthi B.P. which gives

* This is the eleventh of a series of articles on war medicine, A.R.P. and allied subjects which are being published since May, 1943—EDITOR, *J. Indian M. A.*

good absorption and good elimination with minimum accumulation. A liposoluble bismuth also gives good account. To control the activity of the spirochætes we have neoarsphenamine and what is required besides is a prolonged continuous and slow acting bismuth preparation administered to maintain the spirochæticidal action in the interval between arsenic injections and during the rest periods. This is the principle of combined treatment.

Mercury. This is a time-honoured drug used in the treatment of syphilis. Paracelsus (1493-1541) is credited with the use of this drug for the first time in the treatment of syphilis. Even to-day it has a limited place in the treatment of certain conditions. But it has been mostly displaced by bismuth which is more potent as a spirochæticide and less painful. Mercury can be administered orally, intravenously, intramuscularly and by inunction. Intramuscular is the method of choice. The preparations commonly used are: grey oil, *i.e.,* metallic mercury in a state of fine sub-division suspended in creocamph and palmitin basis as in Lambkin's cream or Squire's cream, calomel cream, and mercury salicylate suspended in creosote and camphor or in chloretone.

Iodides. These were first introduced by William Wallace of Dublin in 1834. They dissolve the newly formed fibrous tissue and thus demolish the protective barrier. Like the sappers and miners they are, therefore, of value in preparing the ground for the action of other antisyphilitic drugs. They possess no spirochæticidal property; so their use in early cases seems to be empirical. But they are generally given between courses of treatment during the first fortnight of the rest period. In late syphilis, treatment should be started with iodides and continued throughout later in combination with other remedies. Sodium iodide, 10 per cent, or colloşal iodine intravenously is equally good. They are not so extensively used as they should be. One advantage of this method of administration is its freedom from iodism. One definite contraindication in addition to idiosyncrasy, is the presence of thyroid adenoma.

Antisyphilitic drugs, particularly the highly potent arsenic preparations, should be selected with care. Cole's criteria in the selection of an anti-syphilitic preparation are low toxicity, high therapeutic index, rapid action, easy administration, cheapness and ready availability. Years of experience, investigation and study are required for assessing the therapeutic effects of any new remedy. Rigorous control must be arranged which even the best organised clinics will find difficult to carry through. No physician should light-heartedly take on himself the onerous task of testing the therapeutics of any new antisyphilitic drug. The condition of drug trade in this country are deplorable. Here, as in many other countries, knowledge about drugs is disseminated by the travelling agents of manufacturing chemists. Some of the materials may be of high quality while there may be many of lamentably low standard with minimum investigation done about their toxicity, safety and effectiveness. Such agents are often supported by reports of isolated and inexperienced medical men. For this reason, only preparations which have secured the verdict of massive experience of organised groups and centres of clinical and experimental investigations, should be used.

There are many conflicting views about any one line of treatment, the amount of treatment necessary and the duration of treatment required in early syphilis. The two alternative schemes recommended by the committee of experts appointed by the health organisation of the League of Nations are: the "concurrent-intermittent" treatment, and the "alternating-continuous" method. In the former arsenic and bismuth are given together in combined courses of about ten weekly injections each. These courses are interrupted by short intervals throughout treatment. The distinctive feature of this method is the rest intervals of about four or five weeks between courses. The "alternating-continuous" course is uninterrupted treatment with arsenic and bismuth alternately for a given period with no rest periods. The first method is the one commonly used in England and the other in the United States of America. Probably both are almost equally effective as the intermittent treatment may in effect be continuous or practically continuous owing to the continued absorption of bismuth from the sites of the injections for some weeks after the temporary suspension of the treatment. These courses are as a rule applicable to all young and otherwise healthy males. The females require slightly smaller doses. Older persons and those with other concurrent diseases demand special consideration.

PLAN OF "CONCURRENT-INTERMITTENT" TREATMENT FOR EARLY SYPHILIS—MALES

Week	*Neoarsphenamine*	*Insoluble compound of bismuth*
1st	.. 0·3 to 0·45 gm	0·2 to 0·24 gm.
2nd to 8th	.. do	do
9th	.. nil	do
10th	.. nil	do

Note: (*a*) For those cases which remain or become serologically negative during or by the end of the first course, four such courses should be administered with intervals of three to five weeks between any two courses.

(*b*) For those cases which have not become sero-negative by the end of the first course, further courses should be administered until they have received a minimum of three courses after the serum reaction has become negative.

(*c*) Non-pregnant females should receive the same amount of treatment as the males, but the dose of the arsenical should be reduced slightly.

Massive dose therapy—Recently a massive dose therapy has been evolved by the United States of America. Mapharside is the drug of choice and 1200 mgm. are given by the intravenous drip method over a period of five days, *i.e.,* 240 mgm. daily which takes about 8 to 10 hours. But this method involves hospitalisation of the patient. The process is complicated and irksome and produces troublesome side-effects. As an alternative the same amount of drug is administered in multiple divided doses extending over a few days. If these methods prove successful, Ehrlich's dream of *therapia sterilans magna* will be achieved.

Principles of treatment in early syphilis (modified from Stokes)—

1. The aim of treatment is radical cure.
2. No shortened or abortive courses. Treat to maximum in all cases, determined only by tolerance and protected in every possible way.
3. Begin treatment in the sero-negative primary stage.

PLAN OF "ALTERNATING-CONTINUOUS" TREATMENT FOR EARLY SYPHILIS—MALES

Days or week	*Nearsphenamine*	*Insoluble compound of bismuth*	*Serlogical examination*	*Remarks*
Days 1, 5 & 10	0·3 to 0·45 gm.	—	—	Watch for provocative serological reaction. Examine C.S.F. if possible.
Week 3 to 6	do	—	—	
„ 7	do	—	1	
„ 8 to 11	nil	0·2 to 0·24 gm. 4 doses and potassium iodide		
„ 12	0·3 to 0·45 gm.	nil	1	
„ 13	do	nil	1	
„ 14 to 16	do	nil	—	
„ 17	do	nil	1	
„ 18 to 23	nil	0·2 to 0·24 gm. 6 doses and potassium iodide		
„ 24 to 29	0·3 to 0·45 gm.	nil	—	
„ 30 to 37	nil	0·2 to 0·24 gm. 8 doses and potassium iodide		
„ 38	0·3 to 0·45 gm.	nil	1	
„ 39 to 42	do	nil	—	
„ 43	do	nil	1	
„ 44 to 53	nil	0·2 to 0·24 gm. 10 doses and potassium iodide		Note that the bismuth courses are becoming longer.
„ 54	0·3 to 0·45 gm.	nil	1	
„ 55 to 58	do	nil	—	
„ 59	do	nil	1	
„ 60 to 69	nil	0·2 to 0·24 gm. 10 doses and potassium iodide		
„ 70 to 122	Probation no treatment	—	6 to 12	
„ 123. Complete physical and neurological examination, lumbar puncture and, if possible, fluroscopic examination of the heart and great vessels.				

4. Give not less than 20 and preferably nearer 40 injections of an arsenical with the attendant heavy metal treatment.

5. Treat continuously without full rest periods.

6. Observe moderation in dosage. Let the first dose never exceed 0·3 gm. and in this country all doses should vary from 0·3 gm. to 0·45 gm.

7. Examine the patient before beginning the treatment including urine, which should be repeatedly examined before every treatment. The importance of a complete routine physical examination of every patient of syphilis cannot be over-emphasized. The older the patient, the greater is the need for caution. A man of fifty years with perhaps some hypertension, some damage to his cardiovascular system or some signs indicative of the damage to the kidneys or liver, to be subjected to the routine antisyphilitic treatment with the arsenical and heavy metals is a great risk. Such an individual will live longer and happier with a very moderate regime of antisyphilitic treatment.

8. Always use a system of combined treatment.

9. Give bismuth the preference over mercury in combined treatment.

10. Pay no attention to the serological tests, once the treatment has been started.

11. Never use a blood test as a guide to infectiousness. Infectiousness is determined by the nature of the case, length of time—first five years—and the amount of treatment.

12. A spinal fluid test is desirable at the end of six months and essential before all treatment is stopped.

13. Discourage marriage within three years and pregnancy within five years even in favourable cases.

14. Treat husband before, wife before and after conception, if both have early syphilis.

15. It should be remembered that all the drugs in the treatment of syphilis give rise to various types of reaction. Some are mild and simple, others are complicated and serious. Always question the patient how he felt after the last injection; and always make it a point to examine the conjunctivæ, the gums, the skin and the urine. Impress upon the patient the necessity for reporting anything unusual before taking treatment.

16. Never attempt to give an arsenical injection without a bottle of adrenalin chloride, ten per cent sterile sodium thiosulphate solution and a spare sterile syringe.

Treatment of late syphilis—In early syphilis the nature of the lesions and the distribution of the spirochætæ are more uniform and fairly known. In late syphilis the location of the organisms and the nature and extent of the lesions are diverse and hidden. The spirochætæ may be found in any organ or tissue and any tissue in the body may be the site of a lesion. The lesions also depend upon the general health and the resistance of the individual. So the aim of treatment in late syphilis is not the destruction of every lingering spirochætæ in the body but to arrest the further progress of the disease so

that the continued destruction or degeneration of the highly specialised and delicate structures may be prevented. It is not possible to achieve a biologic cure or to completely eradicate the infection in late syphilis by any kind of treatment known. So the object of treatment is the relief of symptoms and the re-establishment as far as possible of the histology and function of the organ affected. It is also important to note that relapse should be prevented and this is possible only by prolonged treatment and life-long observation of the patient. The persons suffering from late syphilis are much older than those suffering from early syphilis and thus liable to be affected by other complicating diseases which may shorten the life of the individual, modify the course of syphilis or be more intolerant to the usual antisyphilitic drugs.

In late syphilis the treatment should be arranged as not to produce Jarisch-Herxheimer reaction. The drug to be started with should be milder and less potent and the progress of treatment should be slow but steady. There is no necessity for hurry as there is no endeavour made nor is it possible to achieve dramatic result as in early syphilis. Otherwise the dramatic effect will result in therapeutical paradox. In late syphilis it is the patient that has to be treated and not the disease as in early syphilis. So each case has to be considered on its merits and no hard and fast line in the method of treatment can be laid down as in early syphilis.

After thorough physical examination including a fluoroscopic examination of the heart and great vessels particularly in cardiovascular syphilis and the examination of cerebrospinal fluid particularly in neurosyphilis, the treatment should be begun with potassium iodide by mouth 10 to 15 grains three times a day which may slowly be increased to 90 grains a day. After a fortnight, if everything goes well, small doses (0·1 gm.) of an insoluble bismuth compound may be given intramuscularly. The iodide should be continued. The full dose of bismuth (0·2 gm.) may be reached in a few weeks when again if everything goes well, small doses of an intramuscular arsenical (0·1 to 0·15 gm.) such as sulpharsphenamine may be given. Two small doses bi-weekly is better than one single large dose weekly. The iodide and bismuth must be continued. In a few weeks full doses of the intramuscular injection of the arsenical will be reached and if the case progresses well then small doses of an intravenous arsenical can be given (0·1 to 0·15 gm.). The dose of this can then be slowly increased to the usual maximum. This can be achieved in about three to four months. All along bismuth and iodide should be continued. The course of treatment has to be continued periodically and the patient kept under observation all his life time.

Cardiovascular syphilis—In these cases the treatment depends on the general condition of the patient, whether there is failure of compensation or not. If there is failure of compensation the patient should be put to bed and treated first on general lines for cardiac failure. After the condition of the heart has improved the treatment outlined above may be given in addition to cardiac tonics and sedatives.

Neurosyphilis—In neurosyphilis besides the trivalent compounds of arsenic, pentavalent compounds such as tryparsamide are also useful. Tryparsamide is a white crystalline powder, readily soluble in water producing a neutral solution. It can be administered intramuscularly or intravenously but the latter is the method of choice. Though its treponemicidal property is very much lower than its trivalent cousins, it has more penetrating power into the nerve tissues and a marked tonic action. Generally it does not produce any constitutional disturbance and the toxic reactions usual to the trivalent arsenicals are rare. One important risk is the damage it might cause to the optic nerve. So it is advisable to get the fundus examined by an ophthalmologist and to record the fields of vision before starting the treatment. If any contraction of the visual fields is noticed after the commencement of the treatment, the drug should be stopped and there will be no further damage. The dose is 1 to 5 gm., the average usual dose being 3 gm. A course is about 24 to 30 gm.

Another form of treatment of neurosyphilis is by induction of fever. Pyrexia can be produced by (*a*) physical methods; hot water, diathermy, Kettering hypertherm, (*b*) injection of proteins: sulfosine, milk, vaccines such as T.A.B., tuberculine, etc., and (*c*) inoculation of diseases like malaria, rat-bite fever or relapsing fever. Of these benign tertian malaria is considered to be the best. Malarial blood is withdrawn from a suitable donor and the patient is inoculated with it irrespective of the blood group either immediately or later if citrated. Three c.c. of blood are given either subcutaneously or intravenously. The incubation period is about seven days and the patient is allowed ten to fifteen rigors before it is controlled by quinine. The fever may have to be interrupted earlier if the patient's condition demands it. Contraindications to pyrexial therapy are old age, gross diseases of the heart and great vessels, of liver and kidneys, pulmonary tuberculosis, chronic alcoholism, diabetes, severe anæmia, obesity, advanced nervous disease and pregnancy.

Pregnancy and syphilis—Pregnancy by itself is a protection for the mother against syphilis and so the treatment during pregnancy is for the benefit of the child in her. There is enough evidence that if treatment of the pregnant mother is started earlier than the fifth month, a healthy child can be promised. The pregnant woman stands the antisyphilitic treatment as well as the non-pregnant one. The only difference is that her kidneys are working at great pressure and so a rigid watch should be kept over the kidneys and liver. Another difference is the fact that there is not enough time for rest periods. Hence the treatment has to be continuous if begun after the fifth month; but an injection may be missed now and then. In any case it is always advantageous to give a few injections of arsenic towards the end of pregnancy. Whether the pregnant mother had antisyphilitic treatment or not, the baby should be under observation for a minimum of two years The child of a syphilitic mother should not be treated for congenital syphilis as a routine, unless the child has visible manifestations of syphilis or has positive blood Wassermann after a month of its birth. The mother must complete her treatment after confinement. For the sake of the child, it is advisable for a woman who is syphilitic to have one course of antisyphilitic treatment during every pregnancy, whatever the amount of treatment she had and whatever the age of her syphilis.

(*Continued on page 218 Col. 2.*)

JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION
CALCUTTA, APRIL, 1944

AFTER THE FAMINE

In the year 1943 we saw one of the worst famines in human history raging in Bengal and some places of South India. We drew the attention of our readers and the government to this possibility on two occasions[1, 2]. The inevitable happened and thousands of people died. The total number of deaths from starvation is still being debated everywhere. We again repeat that strarvation brings disease in an epidemic form and we are passing through a period when epidemics are taking a heavy toll in the province of Bengal. Inspite of the bumper crop of rice in 1943, destitution is still the fate of many men, women and children as will be seen from the following discussion in the Bengal Legislative Assembly[3]:

"During the question hour Mr. T. N. Mukerjea, Minister-in-charge replying to Maulavi Abu Hossain Sarker (Proja), said that up to December 31 last, there were 155 destitute camps in Bengal. Altogether in those camps 73,049 persons had been accommodated, 21,237 living in them on December 31 last. Deaths in those camps totalled 3,603. Answering a supplementary question the minister stated that at present there were 233 such camps in the province." Disease and destitution go together. The Committee of Enquiry into Effects of Starvation, Indian Research Fund Association[4] found that malaria (mostly malignant), dysentery (sometimes amœbic but more often bacillary), pneumonia, nephritis, bronchitis, 'Naga Sore', tuberculosis, anæmia, urinary tract infections etc. were the commoner diseases among the destitutes. Though frank cases of vitamin deficiency were rare, one expects them in the chronic starvation cases.

The situation has further deteriorated. Epidemic diseases are now raging among non-destitutes and destitutes. It is not possible at present to enunciate the cause of the epidemic nor it is known how far malnutrition among the whole population due to famine conditions last year is responsible for this. But it is certain that for some reasons the immunity among the people has been brought down to a dangerous level. It is difficult to know the position and extent of the epidemic in the province. Nobody knows how far scientific methods are applied to collect the statistics and if a more responsible officer than the village *Chowkidar* is entrusted to report the onset of an epidemic in a village and what part is being played by the deaf and mute Public Health Department of the Government of Bengal. One can only make a rough idea of the perilous position of health from reports which appear from time to time in the lay press. In Calcutta, the second city of the British Empire, the reported death roll in the recent four weeks of 1944, has been successively 1333 (March 25), 1266, 1191, and 1206 (April 15) with an average of 1249. The average for the corresponding four weeks in the spring of 1938 was 795, of 1939 was 834, of 1940 was 641 and of 1941 (a bad small-pox year) was 1,008. According to a report dated April, 6, in Dacca, a town in East Bengal deaths during February numbered 1446 as compared with only 324 and 248 respectively in the corresponding months of 1943, 1942. Of this February's death 461 were from small-pox. During the fortnight ending in April 8, there were 1207 attacks and 246 deaths from small-pox and 110 cases and 61 deaths from cholera in the rural areas of Faridpur district[5]. Six districts in the province have been notified as places threatened with an outbreak of small-pox and cholera, according to notifications published in the Calcutta Gazette. Nine other districts have also been declared as places threatened with an outbreak of small-pox. Temporary regulations have been prescribed by the Governor for the prevention and control of the diseases in these places[6]. Two things that come out prominently from above is that the death rate is still unusually high. Malaria, small-pox and cholera are the curse of the province and these are preventable diseases. Secondly the epidemics are early in their onset and seems to continue unabated.

The picture is gloomy indeed. Nobody knows what catastrophe awaits in the future. Whatever medical help has been rendered, it is still inadequate and it has not been able to lower the death rate. The province of Bengal is supposed to possess an Assembly where elected representatives of the people sit. While they indulge in petty jealousies and quarrels, thousands of their own flesh and blood are being killed by preventable diseases, the virulence of which can be stopped if they want. Last year's famine scarcely moved them. But epidemics are no respector of wealth, caste or creed. It is a sacred duty not only to one's own self but also to our country to stop this mass murder. Let us start now, it is never too late.

PSYCHOSOMATIC MEDICINE

"a body, yet distempered
which to his former strength may be restored
with good advice and little medicine" (Henry IV, ii, 3, 1)

"Mens Sana in corpore Sano" is an old adage and in medicine too much stress on body has been given. Probably Socrates first pointed out that body is not separate from soul and it has been aptly expressed in Plato's charmides, as "One look to the cure of the 'soul' in order to cure of the body." But nobody took any notice of the fact till Freud brought it out again in limelight, popularised and put the exploration of the mind on a more or less scientific basis. And now it has been recognised that, "a chronic neurotic disorder is capable of building up definite tissue alterations in various organs of the body to satisfy through libidinal catharsis a *status quo* between respective claims of the Id, the Ego and the Super-ego."[7]

[1] EDITORIAL, *J. Indian M. A.*, **12**:167, 1943.
[2] IDEM—*Ibid*, **13**:27, 1943.
[3] THE STATESMAN—*Town Edition*, April 26, 1944.
[4] The Committee of Enquiry into Effects of Starvation, Indian Research Fund Association—*Indian M. Gaz.*, **79**:75, 1944.
[5] THE STATESMAN,—*Town Edition*, April, 26, 1944.
[6] THE AMRITABAZAR PATRIKA,—*Town Edition*, May 11, 1944.
[7] JELLIFFE, S. E.—Sketches in Psychosomatic Medicine, 1939, Nervous and Mental Disease Monographs, p. 7.

This was confirmed by Hurst[3] at the end of the first World War, who showed that quite a large number of contractures and obvious physical disabilities, sometimes of long duration and often associated with trophic symptoms, could be cured by psychotherapy. Gordon[3] also reported cases of similar nature.

Dunbar took the trouble in 1935 to write an erudite book entitled, "Emotions and Bodily Changes" with a vast amount of clinical materials and a society have been formed in America to investigate into these psychosomatic problems. This society has published a few monographs on the subject and is publishing a journal, "Psychosomatic Medicine."

The scope of psychosomatic medicine has been stated as[4] "to study in their interrelation the psychological and physiological aspects of all normal and abnormal bodily functions and thus to integrate somatic therapy and psychotherapy. It is not restricted to any specific field of pathology, it designates a method of approach to the problems of etiology and therapy rather than a delimitation of cure, in fact it concerns itself with the psychological approach into internal medicine." This aptly describes the scope and domain of the subject and clears the obscure points in other less lengthy definitions e.g., "bodily disorder whose nature can be appreciated only when emotional disturbances (i.e. the psychological happenings) are investigated in addition to physical disturbances (i.e. somatic happenings)"[5].

The pertinent question that naturally arises is what are the diseases in which the wary physician should look for psychological factors? Here where one can almost catch the psychosomatist. Halliday (*loc. cit.*) has published an excellent article to show that no system—whether gastrointestinal, cardiovascular, respiratory—is exempt from the domain of psychosomatic medicine. Even tropical diseases are not excepted, as psychologist assure that it is the tropical diseases which form the bases of "tropical neurosis". Now come Rome and Fogel[8] to show that profound psychological changes are found in filariasis specially when these occur in American soldiers. But most systematic work is probably being done in the domain of gastrointestinal diseases. An article on the subject is published in another place of this issue of the Journal, where Capt. Wegrocki[9] has discussed the various problems of the gastrointestinal tract from the point of view of a psychologist. In many universities of America, eminent people have engaged themselves in investigating into the purely psychic side of the picture.

[3] HURST, SIR A. F.—Seale Hayne Neurological Studies, 1919, London, pp. 43 & 60.
[3] GORDON R. G.—*Ibid.*, pp. 228 & 296.
[4] EDITORIAL—Psychosomatic Medicine quoted by Gordon R. G. *Edinburgh M. J.*, **47**:30, 1940.
[5] HALLIDAY J. L.—*The Lancet*, **2**:692, 1943.
[6] THROCKMORTON T. B.—*Illinois M. J.*, **82**:462, 1942.
[7] GORDON R. G.—Preface, An Introduction to Psychological Medicine, 1936, Oxford University Press P. V.
[8] ROME H. P. AND FOGEL R. H.—*J.A.M.A.*, **123**:944, 1943.
[9] WEGROCKI, H. J.—*J. Indian M. A.*, **13**:225, 1944.

It is a truism, therefore, that the general practitioner of today shall have to be a psychologist of some sort or other. "As a matter of fact, psychotherapy is used, consciously or unconsciously, by every physician. Every good doctor is a psychotherapist, believe it or not. In the art of medicine, the basic element is the psychologic insight into the patients' mentality ..... since a large number of diseases of modern man belong to that great class called neurosis."[6] This is aptly seen in the method of treatment by Weir Mitchell. He realised that all illness is mainly due to two factors—undernourishment and fatigue. And to treat fatigue successfully one is to take resort to psychotherapy of some kind. A failure to recognise this fact is dangerous as is aptly said by Gordon[7]:

"In the course of his (medical man's) medical and more particularly of his surgical training it was only too frequently suggested that he should regard those patients who did not present clear cut "organic' symptoms and signs as in some sense dishonest and in any case beneath his notice and deserving of no respect or consideration.

"When he got into practice, however, he found that a large percentage of his patients were mentally sick. When he treated them with a minimum of respect and consideration, as he had been taught to do, his practice decreased, and his patients transferred themselves to some kindly and worldly-wise senior."

How vivid and true is this!

So this can at least be said with certain amount of dogmatism that as our duty as a physician is to cure a man and not merely a symptom, an understanding of the mental make-up of our patients along with their physical disabilities, give us an estimation of the patient as a whole, which knowledge is sure to be of some advantage for proper treatment.

The problem brings up another point in prominence also—the Public Health point of view. If psychological factors help in prolonging the common ailments then will Public Health look into the mind of the constituency of a country? Gordon[10] is of opinion that, "It is by no means improbable that if people made the attributes of youth—sexual allure in the case of women and physical prowess in the case of men—to a less extent the be all and end all of existence, there might be less hyperpiesia in later life" and he prescribed a remedy, "they must learn to be interested and content right on through life, with an adaptable interest to changing conditions and capacities and a contentment which is not the contentment of apathy but of achievement." This seems to be an echo of what our sages told centuries ago.[11]

"When all the desires that cling to the heart are loosed away from it, then the mortal becomes immortal, even here he possesses the Eternal."

[10] GORODON R. G.—*Edinburgh M. J.*, **47**:30, 1940.
[11] Brihadaranyaka Upanishad IV, 4, 7 quoted by Sri Aurobindo in Life Divine Vol. II(2), 553, 1940 Arya Publishing House, Calcutta.

CASE NOTES

MALARIAL NEPHRITIS

N. ANANTHA RAO, B.A., M.B.B.S.,
Raichur

A Mahomedan lady aged 30, came for treatment on 25-2-43. She complained of swelling of the whole body, duration two months. She was in the sixth month of her fourth pregnancy, the previous three being normal. The patient gave a further history of suffering from fever attended with rigor, every third day, off and on for the past 6 months. The last attack she had was on a day previous to coming under my observation. The urine was reported to be scanty and high coloured. As narrated by her, the swelling first appeared on the face and quickly spread all over the body, specially the legs. She was under the treatment of a hakim for a week, and then under an allopath for a week. She was given purgatives a number of times and kept on strict bland diet. She discontinued all treatment for a week; but the troubles being on the increase she sought medical advice.

The face, the body, and specially the lower extremeties were œdematous.The heart was normal; pulse 80 per minute, with good volume and tension; blood pressure 110/70 mm.; lungs clear; abdominal wall œdematous; liver not palpable; spleen not palpable; there was slight shifting dullness on the abdomen. The patient was not anæmic in spite of the repeated attacks of fever. Blood film showed absence of malarial parasite. Large monos were 5 per cent. Urine examination: 11 ounces for the whole day; the colour was dark brown with white deposit; specific gravity 1030; loaded with albumin; sugar nil; microscopic examination showed phosphates and red blood corpuscles in plenty and epithelial casts a few.

10 grains of quinine bihydrochloride was injected intragluteally, and calcium lactas 10 grs. t.d.s. given orally. The patient was advised not to restrict the intake of fluids and to collect and measure the whole day's urine. The next day there was marked reduction of the œdema of the face and the patient felt gratified. Only 22 ounces of urine was collected. The patient complained that about 2 to 4 ounces of fluid oozed out through the injection spot all through the day. On examination nothing abnormal was found at the spot. There was œdema at the site of the injection. With the initial response, the same treatment, was continued, *viz.*, 10 grs. quinine injections on alternate days and only calcium lactas by mouth. The œdema was completely reduced after the third injection. the general condition of the patient rapidly improved, and the patient was happy to note that she had her usual appetite, and was able to take the food, which she could not do before.

The quantity of urine passed per day gradually increased, and was coming to normal except for a trace of albumin. There was no R.B.C. and phosphates were greatly reduced.

The patient completely recovered.

---

* Notes read and the case demonstrated at a clinical meeting of Raichur Branch of the I.M.A.

CONSTIPATION CURED WITH VITAMIN B_1

INDUBHUSAN ROY CHOWDHURY, B.SC., M.B.,
Muzaffarpore

A lady came with the following complaints:—

(1) She was very badly constipated. She passed stools like marbles which were hard and small.

(2) There was pain all over her abdomen.

She told me at the same time that her constipation was such that she felt most uncomfortable if her bowels were evacuated all at once for as soon as faeces were passed by laxative or purgative she said her abdomen was filled up with air that pressed upwards against the heart, causing palpitation and breathlessness like that of asthmatic people. Therefore, she warned me that I must not give her anything of the nature of laxative or purgative.

She came of a rich and respectable family and was educated. She had given trials to all sorts of medicines as she had been suffering from this trouble for many years. She was an evacuee in Muzaffarpur. The climate too did not do her good regarding movements of her bowels.

She was lean and thin. She was not a heavy eater but she took enough fruits, cereals and sufficient quantity of water. There was no history of constipation in the family and she was very particular in attending to her nature's call every day in the morning. The patient was a primipara and showed no signs of loss of tone in perineal and abdominal muscles. Other factors responsible for constipation *viz.*, nerve lesion such as transverse myelitis or obstruction in the gut by stricture or growth were absent.

Physical examination. On inspection there was nothing particular to note. On palpation, the sigmoid colon, the descending colon and the transverse colon were felt like columns of hard fæces. When they were palpated, the patient complained of pain. The whole of transverse colon upto the hepatic flexure was very easily palpated. The ascending colon could not be much detected. On percussion, there was not much tympanitic note present. Auscultation did not reveal any loud peristaltic sounds.

Treatment. Diet—She took sufficient quantity of fruits and cereals so any addition of cellulose containing food was not necessary. As it has become a fashion amongst the enlightened families now-a-days to eat small quantity of food suggestion for increase of quantity of food was not favoured. Moreover, the lady said that she did not get appetite for food. She could not tolerate eggs, so also milk for it produced much flatulence. She was advised to take citrated milk but it did not suit her; another modification of milk *viz.*, milk boiled with 'Pipul' which produced less flatulence, did not agree with her also. So she was advised to take preparations of milk *e.g.*, Sandesh, Rosogullah etc. for she must have animal protein in some form. As she was very constipated she could not be advised to take mutton, for which she had much liking and the day she took it she was more constipated but it did not add to her flatulence.

Medicines—Vitamin B_1 in the form of Berin (Glaxo) in 10 mg. doses was administered parenterally twice a week. After two injections she felt much relieved, her stools become soft and she began to pass soft stools. She got appetite. Pain

and tenderness of the abdomen were off. Her appearance changed from a sickly one to that of brightness and cheerfulness. After six injections of Berin 10 mgm. twice weekly I increased the dose to 20 mgm. twice weely. She took four injections of Berin 20 mgm. She is now quite happy.

EARLY DERMAL LEISHMANIASIS

S. BHADURY, L.M.F.
Medical Officer, Atiabari T. E., Jalpaiguri (Dooars)

C. K. Male, aged 16 years, first came under observation with a few eruptions of the trunk, elbow and face.

He is a fair-skinned fellow of a average build. The rashes were papular, brown in colour without hyperæmia. He did not complain of any pain or pruritis beyond slight discomfort.

The patient gave history of ascaris infection. So santonin was given at night and saline purge next morning. This produced no change on the eruptions.

Next, adrenalin, ephedrine, calcium injections were tried one after another with no result. By this time the eruptions became numerous and spread all over the body, specially abundant on the trunk and extremities. The rashes turned brown and white patches and depigmented areas appeared.

At this stage he developed remittent type of fever. Blood showed no malarial parasites, still 30 grs. of quinine were given by injection. This had no effect on the fever. Blood was again examined with the following result:—R.B.C. 3,900,000 per cmm. W.B.C. 6,560 per cmm.; Poly (neutrophiles) 47 per cent; Lymphocytes 41 per cent; Monocytes 3 per cent; Eosinophiles 9 per cent; Aldehyde test doubtful; Chopra test moderately positive.

The case was provisionally diagnosed as one of dermal leishmaniasis.

Injection of urea stibamine intravenously was started from 0·05 gm. gradually working up to 0·1 gm. in 8 injections. The temperature came down to normal and patches began to disappear. He was given a total of 3·5 gm. All eruptions completely subsided giving place to healthy skin and the patient got well.

Conslusion—(1) Dermal leishmaniasis without previous history of kala-azar is rarely met with. (2) There was no leucopenia but slightly high eosinophile count. (3) urea stibamine brought about complete relief of symptoms.

My heartiest thanks are due to Dr. C. Sanyal, Jalpaiguri. for encouraging me to write this note.

PANCREATIC TUMOUR WITH CHRONIC PANCREATITIS

K. N. GOUR, M.D., M.R.C.P. (EDIN.), F.R.F.P.S.G., D.C.H., R.C.P.S. (ENG.), D.P.H.

Reader in Clinical Medicine, Medical College, Agra & Physician Thomason Hospital, Agra.

P. Das, aged 46 years, a Hindu male, single, Sadhu by profession was admitted under me in the Thomason Hospital on 21-7-42, with the following complaints:

Pain in the right hypochondriac region for last 2 months. Jaundice—2 months. Inability to take any solid food for one and half months. Vomiting for two months. Pain in the hypogastric region and on the right side of the back for one day.

History of present illness—The patient began to feel pain in the right hypochondriac region two months back. Along with pain jaundice appeared which had been persisting. The pain in the right hypochondriac region used to increase after a meal for a month and a half and then he could not take solid food. He could not pass any urine for a day or so at times and the micturition was painful. He was constipated.

Clinical examination—The patient was fairly nourished, conjunctivæ yellow, nails and palms yellow, tongue coated and moist, epitrochlear glands palpable.

Abdominal examination revealed a hard painful and tender lump, 2"×2", above and to the right of the umbilicus. The swelling started two months back and had been gradually increasing. There was no connection with the liver. The tumour was fixed to the adjoining structures and was not movable. Because of the site of the tumour, persistent jaundice and its fixed nature, a diagnosis of pancreatic tumour was made and the following investigations were carried out: 1. Urine examination—bile present. 2. Stool examination—clay coloured. Total fat—10 per cent; (Split 5·4 per cent; Unsplit 4·6 per cent); 3. Blood Cholesterol—340 mgm. per cent. 4. W. R.—negative. 5. Diastase Index—134 units. 6. Skiagram of the abdomen did not reveal any abnormality of the gall bladder. Skiagram of the chest did not show any abnormality of the mediastinal shadow.

Exploratory laparotomy was performed on 25-8-42 and it was found out that the tumour was arising from the posterior abdominal wall, most probably from the pancreas. A section was taken for pathological examination and the abdomen was closed.

The pathological examination showed the "tissue to be lymphoid in nature. 'The tissue does not correspond to a new growth'. It looks more like a lymphatic hyperplasia, Hodgkin's in nature (?)".

Stitches were removed nine days after the operation on 9-9-42. The jaundice increased, the lump also increased in size the patient's condition got worse and he left the hospital on 21-9-42.

Besides the exploratory laparotomy he had been given iodides, salicylates, urotropine and magnesium sulphate which at times diminished the intensity of the jaundice and improved temporarily his general condition.

This case is of special interest for the fact that the tumour was in connection with the head of the pancrease which had caused pancreatitis as denoted by the increase in the diastase index and the increase of the unsplit fat percentage in the stool.

The doubt as regards its nature of Hodgkin's lymphatic hyperplasia as reported in the pathological report demanded further examination of the tissue but unfortunately the patient left the hospital.

I am thankful to Major General H. C. Buckley, M.D., F.R.C.S., (EDIN), C.I.E., I.M.S., Superintendent of the Hospital, for permitting me to publish this case.

CURRENT MEDICAL LITERATURE

MEDICINE

Blood Pressure and Coronary Occlusion

Master and others (*Am. Heart J.*, **26**:92, 1943) in reporting on the investigation on the blood pressure in 538 attacks of coronary occlusion, slightly over half of which were initial attacks and the remainder second or third attacks, observe the following points:—The incidence of hypertension increased with age. The blood pressure fell in every case, but in a few the fall was slight. A transitory rise in pressure occurred infrequently at the onset of the attack. A rapid fall was somewhat more common than a gradual one. Occassionally the fall did not occur until after a week. The lowest pressure was usually reached between the twelfth and twentieth days. In some cases the initial fall was soon followed by a temporary or permanent rise in pressure. The trend of the blood pressure was similar in the hypertensive and nonhypertensive groups, although a rapid fall was more common in the non-hypertensive patients who died. The systolic blood pressure rarely fell below 90 mm. in the hypertensive group but this was common in the nonhypertensive. When the pressure fell below 80 mm. the patient usually died. In almost one fifth of the patients with a previous pressure of 200 mm. the pressure did not fall below 150 mm. Two-thirds of the hypertensive patients regained a hypertensive level; in half of these this took place before discharge from the hospital and in the remaining half usually within one or two years. The height of the pressure after the attack did not significantly influence the future course of the case with respect to subsequent angina pectoris, heart failure, coronary occlusion or death.

Hypoglycaema in General Practice

Umber (*Deutsche med. Wchnochr.*, **68**:261, 1943, Ref: *J.A.M.A.*, **123**:176, 1943) writes that hypoglycæmia is characterized by neurosympathetic symptoms such as tremor, weakness, accelerated pulse, palpitation, sweating and hunger and by cerebral psychotic symptoms. The latter as a rule do not appear as suddenly as those of the first group. They develop more gradually and may be preceded by headache, depression and visual disturbances. There may develop aphasia, confusion, temporary unconsciousness, stupor, jactiation, temporary psychosis, convulsive laughing or crying and prolonged loss of consciousness. There may also be pupillary rigidity and a positive Babinski sign. Hypoglycæmic attacks often begin with impudent, mischievous and obstinate behaviour in otherwise well-behaving children. The character of the psychotic reactions in hypoglycæmia may be determined by individual psychotic predisposition. Treatment with protamine zinc insulin is more likely to provoke the insidious cerebral symptoms than the sudden neurosympathetic symptoms. Such latent hypoglycæmia is not desirable, and great care is necessary in estimating the proper dose of depot insulin. There is a spontaneous hypoglycæmia in which insulin medication plays no part. This he further differentiates into that caused by indirect insulinism. Hypoglycæmia developing in the presence of insulomas or of simple functional hyperplasia of the islands of Langerhans belongs to the first group, whereas that in which hypophysial functions are involved belongs to the second group. In the treatment of hypoglycæmia dextrose or levulose is effective. Suitable diet will prevent the attacks. Calcium and atropine derivatives will counteract the sympathetic irritability. In cases in which insular tumours are the cause of hypoglycæmia, surgical treatment may obtain a cure. The patient's constitution, his endocrine and central make up, is of great importance in the development of hypoglycæmia.

Acute Typhoid Cholecystitis

Rubenstem (*J.A.M.A.*, **122**:1008, 1943) writes that acute cholecystitis as a complication of typhoid may appear during the course of the disease or early in convalscence. Any case of acute cholecystitis in which the onset of gallbladder symptoms is preceded by a bout of unexplained fever should be studied as a possible case of typhoid. Chronic cholecystitis is a frequent result of the localization of the typhoid bacillus in the gallbladder of typhoid carriers. Every patient with gallbladder disease who has a definite or suggestive history of typhoid should be placed on typhoid precautions until laboratory study excludes the carrier state.

Sulphamerazine: Clinical Evaluation in 116 Cases

Hall and Spink (*J.A.M.A.*, **123**:125, 1943) gives in the following lines the summary of their observation:

1. Sulphamerazine was administered to 116 patients having a variety of clinical conditions. Fifteen of these patients were infants under 1 year of age.

2. Sulphamerazine appeared to be as effective as sulphadiazine in the therapy of 40 cases of pneumococcic pneumonia or bronchitis. Sulphamerazine was less effective than sulphathiazole in the treatment of staphylococcic sepsis. Thirty-three patients with streptococcic infections responded as well to sulphamerazine as a comparable group did to sulphadiazine.

3. Two cases of meningitis due to type B influenza bacilli and 3 patients which meningococcic meningitis recovered with sulphamerazine.

4. Compared to sulphadiazine, when sulphamerazine was given orally adequate blood concentrations necessitated smaller doses given less frequently.

5. Sulphamerazine does not appear to be any more toxic than sulphadiazine. The drug did not produce any demonstrable neurologic complications. Sulphamerazine caused less nausea and vomiting than sulphapyridine, and fewer skin eruptions and instances of drug fever than sulphathiazole.

6. Two instances of nonfatal urinary tract complications were produced by sulphamerazine. The complication appeared due to the extrarenal precipitation of crystals resulting in the mechanical obstruction of a free flow of urine. There is evidence that an adequate fluid intake and alkalization of the urine may prevent such complications.

Pectin Agar in Tuberculous Enterocolitis

Crimm and others (*Am. Rev. Tuberc.*, **47**:493, 1943) write that excess of calcium and of vitamins D and C in the diet did not augment the cure. 24 patients of whom 20 had far advanced and 4 of moderately advanced disease were placed on low collulose diet and pectin agar after being flavoured and

sweetened to suit the taste of the individual. Of these 24 cases, 8 (33·3 per cent) died in the hospital, 10 (41·3 per cent) have apparently recovered, 2 (8·3 per cent) are improving and 4 (16·6 per cent) left the hospital before the completion of the study. The authors maintain that pectin agar is of decided value in controlling symptoms of intestinal tuberculosis.

Prophylactic Value of Sulphadiazine in Cerebrospinal Meningitis

Kuhns and others (*J.A.M.A.*, **123**:335, 1943) write that sulphadiazine was used prophylactically to more than 15,000 soldiers in residence at two posts where meningococcic meningitis was particularly prevalent during the spring of 1943 (in one post 3 gm. of sulphadiazine was given by mouth daily for 3 days and in another 2 gm. daily for two days). The result was that the incidence of this infection fell abruptly and only 2 cases of the disease occurred during a subsequent period of 8 weeks whereas 40 cases were found among 18,800 untreated cases.

Meningococcus carrier surveys showed that the administration of sulphadiazine by mouth effectively lowered the carrier rate in the treated group at a time when the incidence of carriers among the untreated controls remained high or actually increased. No serious toxic reaction resulted from the large scale use of the drug, the treated men continuing their usual daily activities during he period of treatment.

Influence of Vitamin C on Wassermann Fastness in Syphilis

Ruskin (*Am. J. Digest. Dis.*. **10**:170, 1943) writes that vitamin C apparently enhances the spirochæticidal effect of bismuth and the trepanosomicidal effect of antimony. The addition of bismuth cevitamate produced negativity in 7 out of 10 positive Wassermann fast syphilitic cases. Vitamin C and glutathione influence the capacity for spirochætes and trypanosomes to take up arsenic, bismuth, antimony and gold. Vitamin C acts as a detoxifier of these heavy metals in the reduced state and can enhance their spirochætal and trypanosomal action. Bismuth cevitamate may be considered an important addition to the therapy of Wasermann fast syphilis.

SURGERY

War Surgery in the Middle East

During the last nine months of 1942, 3,279 battle casualties were admitted to one military hospital in the lines of communication in the Middle East. Because of the enemy's rapid advance to El Alamein the arival of wounded was so rapid that the hospital had to act as a casualty clearing station rather than as a base hospital. The mortality rate for the 300 casualties from Tobruk was 3 per cent and for the 500 casualties from the second battle of El Alamein it was 10 per cent. The mortality rate for 2,679 casualties from the first battle of El. Alamein, when the hospital acted as a casualty clearing station, was only 1·3 per cent. The high mortality rate for the casualties from Tobruk and from the second battle of El Alamein is due to the fact that seriously ill patients were sent to the hospital. The figure 1·3 per cent is approximately accurate for most casualty clearing stations. In analyzing the results, Debenham (*Brit. M. J.*. **2**:223, 1943) emphasizes that all of the wounds dealt with were a result of fighting in dry sandy desert, that the amount of clothing worn was very small so that only rarely was clothing found in a wound, and that sulphanilamide was used prophylactically. As a routine 10 gm. was dusted into the wound and another 10 gm. after operation; 5 tablets (2·5 gm.) were given by mouth at 6 a.m. and 6 p.m. daily for four days. The good results obtained in abdominal cases, particularly in those with bowel perforation, were due to early operation. Of the 11 patients with bowel perforation, the 9 who recovered were operated on in forward areas and were kept there from five to sixteen days. The cardinal points seem to be early operation, late evacuation, intravenous saline drip, continuous gastric suction and sulphadiazine. This is difficult with mobile warfare but was possible when the line of battle was static. The worst cases of burns came from fighting in tanks. Because facilities for preliminary cleansing were not obtainable, tanning was discarded in favour of cleansing and powdering the area with sulphanilamide and dressing with petrolatum gauze. Patients travelled best with plenty of padding, and for wounds of limbs a light, well-padded plaster of Paris cast was definitely beneficial. In the early stage intravenous plasma or serum was considered essential. Blood transfusions were used for secondary anæmia a week or ten days later. Patients with severe burns travelled badly, even up to two weeks after burning. After a long journey they arrived toxic and ill. It is easy to put too much sulphanilamide powder on the burns, especially in severe cases, as sulphanilamide is readily absorbed from burned areas and gives rise to profound toxæmia. Blood and plasma or serum transfusions were used for shock, for burns and during convalescence when the hæmoglobin fell below 60 per cent. Gas gangrene has been rare and gas infection uncommon. No case of tetanus has been seen. Among the "don'ts" to be observed are listed:

Don't suture wounds. Don't suture amputation stumps.
Don't amputate at the site of election; go below it.
Don't use packing except to stop hæmorrhage.
Don't use drainage tubing.
Don't use unpadded plasters.
Don't forget to give morphine before a long bumpy journey.
Don't forget to give plenty of fluids by mouth.
Don't forget that the ligature of a main vessel should be prominently recorded on the field medical card and underlined.

The salient features of war surgery in the Middle East are based on the principles which have been in the process of evolution since the beginning of the war. They are summarized as follows: organized resuscitation and the use of local and general sulphanilamide; thorough immobilization; conservative surgery and wound trimming instead of wound excision; avoidance of tension around wounds and provision of a good blood supply in damaged limbs, and the necessity to adapt and improvise articles to fulfil functions for which they were not intended. (Ed., *J.A.M.A.*, **123**:290, 1943).

Incidence of Gallstones at Older Ages*

Dessau (*New England J. Med.*, **229**:464, 1943) writes that the postmortem records of the Long Island Hospital (Boston, Massachusetts) were examined to determine the incidence of gallstones in the higher age groups. The records

for over 3,000 cases from 1900 to 1942 were studied with reference to the frequency of gallstones in relation to age, sex and lesions of the gall-bladder, and to the question of an increase of cholelithiasis in recent decades. The analysis permitted the conclusion that the incidence of gallstones shows a definite increase with age. Cholecystitis was present in 42 per cent of the men and 34 per cent of the women who had gallstones. Cholecystitis without gallstones was found in 2·5 per cent of the cases. A higher incidence of gallstones was found in the 1933-42 period than in the 1900-1922 period. The sex difference in incidence of gallstones has decreased in recent years.

Acute Virus Infection with Nerve Root Involvement Simulating Appendicitis

Butsch and Harberson (*J.A.M.A.*, **123**:405, 1943) point out the following features of the acute virus infection with pain and tenderness in the right lower quadrants of the abdomen which will be of help in distinguishing it from acute appendicitis:—

1. Sudden sharp onset of localized knife like pain maximal immediately. 2. A flushed face and a punctate erythematous œdema of the soft palate suggesting a systemic infection. 3. Pain that is worse on lying down and at night like pain of nerve root irritation. 4. Pain intensified by coughing, flexing the neck and flexing the trunk like pain of nerve root irritation. 5. Tenderness over the course of intercostal nerves. 6. Absence of elevation of either the total or the polymorphonuclear leucocyte count.

Roentgen Therapy in Gas Gangrene

MacMilan (*Western J. Surg. Obst. & Gynæc.*, **51**:187, 1943) from an analysis of 416 cases from the literature and of 13 new cases all treated with rœntgen ray observes that for early diagnosis repeated rœntgenograms should be taken of the involved areas in injuries where gas gangrene is liable to develop. Prophylactic treatment consists of immediate debridement use of sulphanilamide in the wound and adequate doses of tetanus gas gangrene antitoxin. X-ray will also be helpful. Active treatment should consist of 100 rœntgens over involved areas repeated twice daily for 3 days or until the infection is brought under control, local debridement and therapeutic amount of antiserum if the infection is more than 12 hours old or if the patient does not respond clinically to the foregoing treatment. Of the 410 patients treated with x-ray, 62 died giving a mortality rate of 14·9 in contrast to Millar's analysis of 607 cases treated before the era of rœntgen ray giving a mortality rate of 49·7 per cent. Of the 13 new cases, 3 died.

Roentgen Rays in the Treatment of Malignant Tumors of the Kidneys of Adults*

Kerr and Stephens (*Am. J. Rœntgen.*, **50**:204, 1943) present this report dealing with 37 adults who were treated for neoplasms of the kidney by means of x-ray. They were divided into three groups: (1) those having rœntgen therapy prior to surgery; (2) those irradiated after nephrectomy, and (3) those receiving only rœntgen therapy. Twelve of the 37, or 31·6 per cent lived 60 or more months without evidence of residual or metastatic disease. One patient was followed for 120 months. Eight of the 12 survivors, 66·7 per cent, had preoperative rœntgen irradiation. While this number is obviously too small to warrant any dogmatic statements, it is thought that these results indicate the value of preoperative use of rœntgen rays. It appears that in those operable cases, preoperative rœntgen therapy improves the prognosis while postoperative rœntgen therapy apparently has nothing more to offer than surgical removal without irradiation. Rœntgen irradiation also makes nephrectomy easier by decreasing the bleeding at operation. Rœntgen therapy without surgery is not believed to be curative and is not recommended even though one patient so treated survived 120 months.

Allergy to Injectable Liver Extract: Clinical and Immunological Investigations

Feinbery and others (*Ann. Int. Med.*, **18**:311, 1943) write that allergy to liver extracts is not so uncommon as it appears—a survey of 48 patients showed 6 cases of sensitivity. Common usage of the long interval method allows for more ready sensitization or it may be that a special type of antigen is associated with the antianæmic principle. Treatment of allergic patients consists of discontinuance of injections, a course of desensitization, change to beef liver extract or the oral use of the liver.

Multivitamin Prophylaxis and Therapy in Respiratory Diseases in the Aged

Kay (*Am. J. Digest. Dis.*, **10**:96, 1943) writes that vitamin deficiency in the aged is more frequent than is generally supposed and is among the factors which increase the susceptibility of the aged to respiratory infections. Adequate amounts of vitamins are suggested as prophylaxis and for the general beneficial effects.

PEDIATRICS

The First Month of Life: General Survey

McNeil (*Edinburgh M. J.*, **50**:491, 1943) in considering some problems of the first month of life remarks that the great mass of natal and neonatal deaths has been taken together and shown to be twice or thrice that of the deaths during the remainder of the first year. This early and massive loss of infant life has been allocated to certain pathological conditions that are the immediate cause of death—congenital defects, asphyxia, intracranial hæmorrhage, miscellaneous conditions and infection after birth. All these problems except the last are concerned with the mother and depend on her health in pregnancy, and circumstances and conditions of parturition and they belong to the obstetrician and the midwife. When labour is over, new problems appear—neonatal infection, neonatal dietetics and other miscellaneous conditions and these to a great extent centre round the care of the newborn baby. The care of the baby in the first weeks after birth is the responsibility first of the midwife and next of the health visitor, while the medical charge of the baby is beginning to pass from the obstetrician to the pediatrician. For the solution these problems require cooperation both in study and practice, between all concerned.

Neonatal infection accounted for 27 per cent of neonatal deaths. With the rupture of the membranes, and during the movement of the face and body through the vagina, the eyes and skin become exposed to bacterial attack, while the infection of the throat, lungs and stomach may also take place during

birth through swallowing and breathing. After birth, the baby is open to attack from several fronts, the whole skin surface and inner surfaces of the alimentary and respiratory tracts and a surface infection can easily pass into the blood and become a septicæmia owing to low natural immunity of the newborn baby. Deep infections such as pneumonia, meningitis and septicæmia, seldom show distinctive clinical features and are often only discovered by postmortem examination and the bacterial causes of these infections show a remarkable frequency of staphylococci and B. coli. Thrush when confined to the mouth is a benign infection but when it invades and ulcerates œsophagus it is often fatal. Gastroenteritis which is a common cause of death in older infants, also attacks the newborn.

The first month of life is also a critical time for infant dietetics. If feeding and digestion are successfully established by the end of the first month, it is likely that good digestion and good nutrition will continue to the end of the sixth month when the diet of milk is supplemented by other kinds of diet.

Prematurity, though of great importance in still-births and neonatal deaths is not of itself a cause of death, the great lethal factors remain the same as in mature babies, *e.g.*, congenital defects, asphyxia, intracanial hæmorrhage and neonatal infection but these operate with multiplied power. Prematurity is controlled by reducing the number of premature births, by raising the standard of maternal health in pregnancy and at all times and by reducing the death rate of premature babies after birth by improved nursing and feeding.

Perinephric Abscess in Infants and Children*

Swan (*Am. J. Surg.*, July, 1943) stresses the importance of recognizing that perinephric abscess is not rare in infants and children and that its recognition is especially important if mistakes in treatment are to be avoided. This report is based on a series of 26 proved and 6 possible cases. The author recommends the classification of patients according to whether the lesion is metastatic, is complicated by an underlying renal disease, or is secondary to trauma to the kidney. This classification of patients according to whether the lesion is metastatic, is complicated by an underlying renal disease, or is secondary to trauma to the kidney. This classification is important for both therapy and prognosis. In children a history which includes urinary complaints or a finding of albumin or white cells in the urine strongly suggests a complicated type of lesion, and indicates a thorough study of the urinary tract. An intravenous pyelogram should be done preoperatively on all patients suspected of having perinephric abscess unless they are too ill to tolerate the procedure. For metastatic or traumatic abscess early incision and drainage is the treatment of choice. In abscess complicating urinary disease, therapy must be individualized and is twofold in purpose: first, the immediate treatment of the abscess, and second, the subsequent treatment of the underlying urinary tract disease. In metastatic or traumatic abscess in children, the mortality was nil and the hospitalization averaged about three weeks. In abscess complicating urinary disease in children, the mortality was 45 per cent and the hospital stay averaged about 10 weeks.

Sydenham's Chorea: Review and Treatment of 62 Cases

Senwartzman and Grossman (*Arch. Pediat.*, **60**:194, 1943) write that contributory factors responsible for a flare-up of chorea include focal infection, malnutrition and dietary deficiences, psychic trauma or strain, endocrine dysfunction and eye strain. They further point out that in treatment vitamin B_6, nirvanol and typhoid-parathyphoid vaccine therapy, gave the best results in that respective order. It appears possible that a vitamin deficiency, such as B_6, alone or in combination with others, may be one of the most important factors in the etiology of chorea.

Abstracts marked with an asterisk (*) were received through the courtesy of the United States Office of War Information—Editor, *J. Indian M. A.*

XXI ALL-INDIA MEDICAL CONFERENCE, CAWNPORE

Temple of Service
The Mall
Cawnpore, March 25, 1944.

Dear Doctor,

In Annual Conferences members of the profession gather at one common platform from all parts of India and express their hopes and fears and discuss and record various measures which vitally affect the profession.

This year the Cawnpore Branch of the Indian Medical Association has invited the XXI All-India Medical Conference to be held at Cawnpore in the X'mas week and the Indian Medical Association has accepted the invitation.

Besides other items of interest a Scientific and Medical Exhibition of various pharmaceutical products, medical and surgical appliances and scientific accessories etc., is held and a Scientific Section is organised where papers on subjects coming under the various branches of medicine are read and discussed.

I would, therefore, earnestly request you to appeal to every professional brother and sister to make it a point to join it by enlisting themselves as members of the Reception Committee and to send in delegates and visitors in large numbers, and thus give the Indian Medical Association the necessary strength to safe-guard our interests. Success of the Indian Medical Association means the success of the profession.

The minimum fee for membership of the Receiption Committee is Rs. 15|- and any sum above it that you may choose to pay towards this worthy cause will be highly appreciated.

G. L. Rohatgi,
Finance Secretary

NOTES AND NEWS

PLEA FOR INTRAMUSCULAR USE OF QUININE SULPHATE

The following is the extract from "Quinine" by Dr. Christie Mcguire of Newlands T. E., Dooars, Bengal:

The acute world wide shortage of quinine, particularly euquinine (tasteless quinine) for infants and bihydrochloride for injections has raised some difficult problems regarding treatment in tea-garden practice.

To solve these difficulties which were foreseen the author has been, for the past 18 months, working on a method of using quinine sulphate for intramuscular injection by dissolving the salt in dilute hydrochloric acid. Over 8000 injections have been given and the author is, now, definitely of opinion, that both in therapeutic response and also in the local tenderness at the site of the injection, bi-hydrochloride and sulphate are similar in action and as such the latter can be used safely as a substitute. The method of preparation which is given below is simple and fool proof and can easily be made up, in any tea-garden. There has not occurred any case of abscess formation.

The study of immunity to malaria in adults (256 in number) in tea-gardens brought out the following points: From a month or two after birth until the age of 3-4 years infants suffer from frequent and virulent attacks of malaria and these attacks are controlled by the liberal use of euquinine and quinine injections. From this age onwards the attacks become less frequent and less virulent, immunity is gradually setting in until the adult stage is reached when the fever spontaneously subsides in 82·4 per cent of cases without quinine due to intense immunity. The importance of treating infant malaria and the value of a labourer born in the garden can be fully realised. In *immune cases* the amount of quinine necessary to control the fever is small and the relapse rate shows little difference whether they receive quinine by injection or the oral route. Thus it is quite possible to withold quinine from these immune cases and keep them for use in non-immune cases such as infants, new labourers, Europeans, Bengalees and Punjabis from whom quinine must be on no account be withheld. Individual cases may arise from time to time in immune cases who show malignant symptoms from the beginning and in such cases also quinine must not be withheld.

His conclusions are: (1) In infant-malaria injections are now indispensable owing to the lack of euquinine. Sulphate may be safely used if bi-hydrochloride is unavailable. (2) In malignant malaria in adults who have passed the stage of oral treatment, sulphate may also safely be used for injection. (3) Adult immune labourers require small amounts of quinine to control an ordinary attack of malaria; about 82·4 per cent become fever-free if quinine is withheld.

The method of preparing Quinine sulphate for intramuscular injections:—

(1) Add 100 minims of dilute hydrochloride acid (B.P.) to 10 c.c. of distilled water and dissolve 100 grains of quinine sulphate powder in the solution. Now add enough distilled water to make the total quantity 20 c.c.

Each 1 c.c. now contains 5 grains of quinine sulphate in solution.

(2) Now filter the solution through filter paper. To prevent any of the solution from being absorbed into the paper first moisten it with distilled water.

(3) After filtering boil the solution and keep in sterile rubber-capped or stoppered bottle.

The solution is new ready for use and the usual adult dose is 2 c.c. intramuscularly. This is best given in the upper and outer quadrant of the buttocks.

(4) If all the solution is not used at one time and there is any doubt about the sterility of the remaining quantity, it can be boiled again. The efficacy of the quinine is not affected by double boiling.

(5) The new brand of quinine sulphate issued by the Bengal Government is inferior in appearance only to the old brand. It forms a brownish solution when made up for injections, but it can be safely used.

(6) Do not use dilute sulphuric acid (B.P.) for dissolving the quinine sulphate as after a while the quinine crystallises to the bottom. This does not occur if dilute hydrochloric acid (B.P.) is used.

DIPLOMA IN CHILD HEALTH

The Secretary, the College of Physicians and Surgeons of Bombay writes:—

The Council of the College of Physicians and Surgeons of Bombay at its meeting held in July 1943, decided to institute an examination for a diploma in Child Health (D.C.H. Bom.) and appointed a Committee to draw up regulations for that examination. The Committee submitted its report to the meeting of the Council on 14th January 1944. The report was approved and adopted.

The course, which is of twelve months' duration, has to be taken at a recognised Children's Hospital or in a recognised Children's Department of a General Hospital. The examination is open to persons holding a qualification (a) laid down in Schedules I and II of the Indian Medical Council Act, 1933, or (*b*) granted by any of the various Examining Boards in India whose names were on the Schedule of the Bombay Medical Council in 1941.

MEDICAL SCIENCE EXHIBITION

The above exhibition which is believed to be the first of its kind in India was recently held at the King George Medical College, Lucknow, under the auspices of Clinical Society, K. G. Medical College.

This Exhibition was organised with an idea to dispel ignorance and superstition that exist in the lay man's mind about the structure and working of human body, and in letting him know how modern science ensures health and longevity.

The Exhibition was divided under the following sections:—

(1) History of medical sciences which included an account of the founders of present-day medicine and surgery; their progress through ages, and a series showing stages in evolution of microscope, x-ray, glasses and blood transfusion etc.

(2) Anatomy: (*a*) The unborn, (*b*) architecture (skeleton, bones etc.), (*c*) the internal machinery, (*d*) the plan of unity (comparative anatomy), and (*e*) a journey through ages (the story of the races that ruled the earth thousands of years ago.

(3) Physiology: (*a*) the blood, its composition and circulation, (*b*) what happens to the food you take ?—the dictators

of digestion and what they dictate, (*c*) the special senses showing how one sees, hears, speaks, tastes and touches, (*d*) how the muscles work, (*e*) urine, its abnormal constituents and what they indicate.

(4) Surgery: this was illustrated with exhibits showing the diseases of various parts, artificial appliances and interesting surgical instruments.

(5) Ophthalmology: structure of the eye and its defects were illustrated by charts and specimens.

(6) Obstetrics and gynæcology. This included specimens of various monsters and abnormalities of the fœtus.

(7) Medical jurisprudence.

(8) Hygiene: This included (*a*) a peep in the inside of the man, (*b*) his food, (*c*) his enviroment, (*d*) common diseases and their prevention, (*e*) personal and mental hygiene (maternity and child welfare).

(9) Social diseases: This displayed the world's greatest Public Enemies No. 1 and 2 and the lesions caused by them.

(10) Pharmacology: This included (*a*) experimental section, (*b*) drug section, and (*c*) endocrinology section.

(11) Pathology: (*a*) what diseases we get by microbes, (*b*) parasites and their harmful activities, (*c*) alcohol, its effect on internal organs, (*d*) something about tumours, (*e*) diseases our parents give us, (*f*) freaks of nature.

The exhibition was made more lively and easily understandable by the illustration of each item with numerous exhibits and illustrations which were explained by students demonstrators.

Judging from the public response, the enthusiasm with which it was witnessed by people and its instructive value, it is strongly urged that the organisation of such exhibitions should be made in the different medical institutions in respective cities.

VOLUNTEERS FOR MALARIA TEST AWARDED LEGION OF MERIT

Fifty enlisted men volunteered to expose themselves to malarial infection for a period of six weeks in the jungles of New Guinea. This was to demonstrate the danger of malaria for those not taking preventive measures. A similar group was given atabrine as a malarial suppressive, while a third group used a drug the efficacy of which has not yet been fully disclosed. As a result of this action "beyond the call of duty" the men have been awarded the Legion of Merit. The action of these men is in the best traditions of the Army as exemplified by a similar group of volunteers in the famous experiments under Major Walter Reed, which contributed so much to the conquest of yellow fever.—*J.A.M.A.*

APPOINTMENT OF TEACHERS IN MEDICAL INSTITUTIONS ON COMMUNAL AND EXTRA-ACADEMIC BASIS

A general meeting of the members of the medical profession of Bengal held on 13-3-44 under the chairmanship of Lt. Col. J. C. De, I.M.S. (Retd), formerly Principal, Medical College of Bengal, Calcutta, at the Bengal Immunity Hall of the Calcutta Medical Club at 91-B, Chittaranjan Avenue, Calcutta, under the auspices of the Indian Medical Association (Bengal), the Calcutta Medical Club, and the All-India Medical Licentiates' Association (Bengal), to protest against the policy of the Government with regard to the appointments to the teaching staff in the medical institutions of Bengal, on communal and extra-academic basis.

The following resolutions were passed unanimously:

"This meeting of the members of the medical profession of Bengal, especially convened under the auspices of the Indian Medical Association, the Calcutta Club and the All-India Medical Licentiates' Association, views with grave concern the policy of the Government of Bengal in making appointments, both honorary and salaried, in the Medical Department of the Province, including those in the teaching institutions and in the Medical College, the Medical Schools and in the State and State-aided hospitals, on communal and extra-academic considerations. This meeting is of the opinion that in filling teaching appointments, particularly, the fundamental principles observed in making such appointments all over the world, namely, outstanding merit and scholarship, experience in teaching the particular subject, higher academic qualifications and long practice in the speciality of a clinical subject, should be the only criteria, in the interest of the sick public and the efficient training of future doctors of the country. This meeting, therefore, urges upon the Government of Bengal not to be influenced by communal considerations in filling up these appointments.

Resolved further that a sub-committee consisting of the following members be appointed to devise ways and means to give effect to the above resolution:—

Dr. B. C. Roy, Dr. K. S. Ray, Lt.-Col. J. C. De, Dr. R. Ahmed, Capt. P. B. Mukherji, Dr. M. N. Bose, Dr. Bireswar Mitra, the President of the Bengal Branch of the All-India Medical Licentiates' Association, Dr. S. Datta, Dr. T. Ahmed and Dr. K. K. Sen Gupta (Convener), with powers to co-opt.

DRUGS CONTROL ORDER, 1943.

The following communication dated New Delhi, the 6th April, 1944 from R. V. Fenton, Esq., I.C.S., Under-Secretary to the Government of India, Department of Industries and Civil Supplies to the Honorary General Secretary, Indian Medical Association, will be read with interest:

I am directed to refer to your letter No. Ahmd/C.R./43-44, dated the 20-24th March, 1944, addressed to the Hon'ble Commerce Member forwarding a copy of the resolutions passed at the 20th Meeting of All India Medical Conference held at Ahmedabad in December 1943 and to say with regard to the resolution No. 15 that price lists under the Drugs Control Order are required to be displayed only by retailer licenses. The Provincial Governments are aware that Medical Practitioners who supply dispensed medicines to their patients are not required to take out retailer's licences under the Drugs Control Order and that, therefore, it is not necessary according to the Drugs Control Order for them to display price lists. Any prosecution launched by the Punjab Goverment in this connection before February 15th. 1944 must have been in accordance with their own notification referred to in the resolution and a copy of it is, therefore, being forwarded to the Secretary to the Government of Punjab, Medical and Local Government Department, Lahore, for disposal.

2. I am to add that as already stated in this Department's letter No. 475-CS(D)(39)/44 dated the 4th April, 1944 the

Government of India regrets that the request conveyed in Resolution No. 16 for the exemption of Medical Practitioners from the payment of fees for purchase licences cannot be acceded to.

REOPENING OF THE STALINGRAD MEDICAL COLLEGE

The Stalingrad Medical College has reopened. This is announced by Professor E. Joffe, its Dean and Professor I. Sutin, its Director of Tuition. It was one of the largest medical colleges built in the Soviet Union during the period of the Five Year Plans. Its commodious lecture halls, well-fitted laboratories, capacious library and reading room were housed in a splendid five-storied building situated on a large ground with broad shady avenues.

On August 23rd, 1942 the first bombings of Stalingrad began. The building of the college caught fire. In flames perished valuable apparatus, and the anatomical museum as well as the physiological, biochemical, microbiological and other laboratories. Many scientific manuscripts were destroyed.

In the beginning of 1943 a small group of professors returned to Stalingrad to help to resurrect the college. It was a task of great difficulty. The premises had to be rebuilt and re-equipped, and this, in a devastated city, where labour was scarce and building material hard to procure. Within two months the building was repaired and again laboratories, library, reading rooms, refectory were housed in it. Medical instruments, apparatus, books, medicaments and reagents began to arrive from Siberia, Kazakhstan, the Urals and the Upper Volga. Much of it was sent as gifts by other medical colleges in Irkutsk, Molotov, Ivanovo and other places. Over twenty thousand books were presented by libraries of thirteen medical colleges and by the Central Library in Moscow. Towards the end of September the college was ready to receive students. Application poured in from all parts of the country and reached record figures. For three hundred places of the first year course 1,500 applications were received. The college was able to select the best of youths and girls who had graduated from Secondary School with distinction. Among them were many who had partaken in the defence of Stalingrad.

FIGHTING TUBERCULOSIS IN U.S.S.R.

L. Stocklitsky writes:—"One must particularly note the efforts of our medical workers in checking tuberculosis—that dread of an infectious disease so commonly the scourge of wartime. For a full appreciation of the fact that there has been no increase in tuberculosis in the Soviet Union, it should be noted that the first World War saw a rise in death rate from this disease in the majority of European countries.

"The principal weapon of offensive launched by the Soviet Government against tuberculosis is widspread prophylactic measures for the population at large. A prominent part of this work is played by anti-tuberculosis vaccination, the scope of which is being increased at all time and includes school children of upper grades and contingents called up for service in the Red Army and Navy. To prevent the appearance of tuberculosis the armed forces draftees are given a thorough look over by the medical commissions.

"Until not so long ago a serious drawback to extending the scale of vaccination was the brief period for which liquid vaccine could be preserved. This problem was tackled by the country's scientific institutions, however, and they have produced a dry preparation which keeps much longer and is just about as effective. With the aid of this preparation anti-tuberculosis vaccination can be carried out today in the most remote of districts.

"Early diagnosis, made possible by a ramified network of clinics and hospitals established throughout the country, plays an important role in nipping the disease in the bud.

"For those persons who have had tuberculosis, regular treatment according to the latest methods is available. Curative feeding with increased amounts of protein and vitamin foods is gaining ground."

ERRATA

April 1944 issue:

In page 185, col. 1, line 20 *instead of* P waves of 5 m.m. *please read* P waves over 5 m.m.
In page 189, col. 1, paragraph 3, line 16 *instead of* preponderance close relationship etc., *please read* preponderance. A close relationship, etc.

NOTICE

Capt. K. L. Saha, M.B., has offered a gold medal for the best paper on any subject in Pharmacology to be read at the 1944 session of the All-India Medical Conference.

Research workers and investigators who intend to submit a record of their work on this subject, are requested to send six typed copies of their articles to the Hony. General Secretary, Indian Medical Association, 23, Hindusthan Buildings, Calcutta, so as to reach the latter by the 30th September, 1944.

16-12-1943.

P. B. MUKERJI,
Hony. General Secretary,
Indian Medical Association.